TechDebate :: Are we winning the cybersecurity war? **PAGE 19**

NETWORKWORLD

THE CONNECTED ENTERPRISE ≡ FEBRUARY 13, 2012

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FIRST LOOK > CISCO CIUS

A mobile collaboration device that means business.

Page 30 ▶

Rise of Hadoop challenging for IT

BY ANN BEDNARZ

HADOOP IS coming out of the shadows and into production in IT shops that are drawn to its ability to process and analyze extremely large volumes of data. But the relative newness of the open-source platform and a shortage of experienced Hadoop talent pose technical challenges that enterprise IT teams need to address.

The Hadoop framework grew out of the work of Doug Cutting and Mike Cafarella, who originally developed it to support Apache Nutch, an open-source search engine. It became an Apache project when Cutting and a team of engineers at Yahoo split the distributed computing code out of the Nutch crawler to create Hadoop.

Today Hadoop powers every click at Yahoo, where the Hadoop production environment spans more than 42,000 nodes. That kind of scalability is a sweet spot of Hadoop, which is designed to handle data-intensive distributed applications spanning thousands of nodes and exabytes of data, with a high degree of fault tolerance.

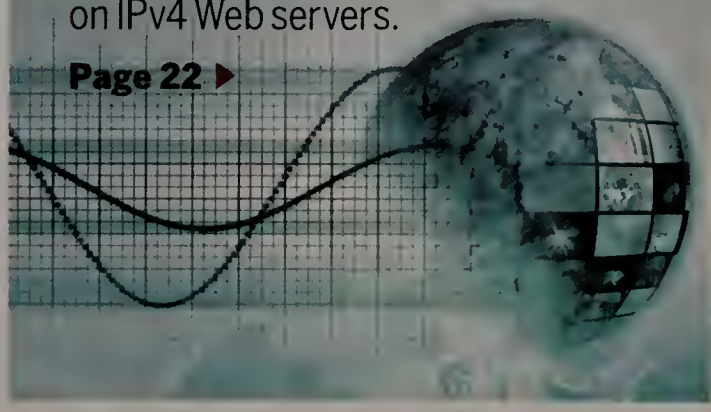
▶ *See* **Hadoop,** *page 32*

CLEAR CHOICE TEST

IPv6 deployments start at network's edge

Six Application Delivery Controllers deliver IPv6 capabilities to apps hosted on IPv4 Web servers.

Page 22 ▶



Smarter technology for a Smarter Planet:

How 3.8 million tailored messages made sales numbers look fantastic, too.

Japanese fashion retailer Start Today took an IBM smarter commerce approach to their business, helping increase annual sales on their Zozotown Web site by 54.2%. Their customer-centric focus uses Netezza® and Unica® to rapidly analyze massive amounts of data, letting them create personalized messages for each of their 3.8 million customers. Results? The solution helped increase the e-mail open rate by five times and the conversion rate by nearly 1,000%. Smarter commerce is built on smarter software, systems and services.

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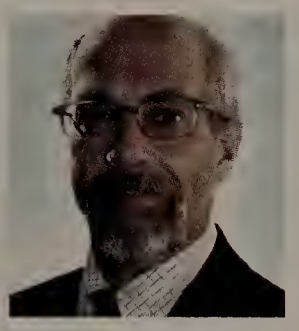
FROM THE EDITOR | JOHN DIX

Apple tops the $100B+ tech club

Ten years ago Apple posted revenue of $5.3 billion, a mere gnat compared to the IBM elephant which topped all tech companies with sales of $85.8 billion.



Oh, how the tables have turned.

Apple's sales have now surpassed those of HP, IBM, and even AT&T and Verizon, two companies that helped propel Apple to the top of the elite club of tech companies that have more than $100 billion in sales.

The fiscal years of the largest tech companies don't neatly align so it requires a little work to get a sense of how they compare. Apple's fiscal 2011 ended Sept. 24, with the company posting $108 billion in revenue and $26 billion in net profits. But if you slide the 12-month view forward a quarter so it spans fiscal 2011 Q2, Q3, Q4 and the all-important holiday month in Apple's 2012 fiscal Q1 (ended Dec. 31), the company recorded sales of $127.6 billion and profits of $32.8 billion.

That edges out HP as the top tech dog, which finished its fiscal 2011 year Oct. 31 with sales of $127.2 billion and an operating profit of $9.7 billion.

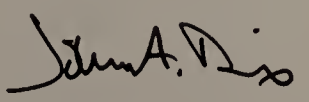
But that still leaves a little discrepancy in timing, so let's dig deeper. HP won't announce its first-quarter results (for the period ending Jan. 31) until later this month, nor does the company give sales guidance, but the consensus expectation of 25 analysts tracked by *Bloomberg Businessweek* is that sales will be down 5% for the quarter to $30.8 billion, meaning sales on a trailing 12-month basis as of the end of January will be about $125.7 billion.

Apple, on the other hand, has forecast sales will be up 32% in the next quarter, so a little math indicates sales on a trailing 12-month basis as of the end of January were $130.2 billion. The baton has officially been passed.

And what of mighty IBM? Big Blue is on a calendar year and reported in late January that it finished 2011 with sales up 7% to $106.9 billion, some $20 billion behind Apple for the same 12-month period. And even though IBM can hold its head high because its lusty 15% profit margin dwarfs what HP squeezes out of sales, it can't hold a candle to Apple's 25% margin.

AT&T, for its part, racked up sales of $126.7 billion for the calendar year, just behind those of Apple. In its earnings release posted in late January, AT&T reported it activated more than 7.6 million iPhones in the fourth quarter, the majority of which were 4S phones that didn't even go on sale until Oct. 14. AT&T's total wireless subscriber base is now 103.2 million. Verizon is also in the $100 billion-plus club, with 2011 sales of $110.9 billion and 108.7 million wireless subscribers.

But Apple leads the pack. All hail the new tech titan.



inside

FEBRUARY 13, 2012

peersay

Apple in the enterprise

I LOVE APPLE products but I can't imagine having to do IT with them on an enterprise level. The problem we have, however, is twofold (Re: "Apple forcing IT shops to 'adapt or die'"; tinyurl.com/7ad4rtz):

1. We as IT people are beholden to our users. If everyone is clamoring for an iPad and we give them Galaxy Tabs, to an extent we aren't doing our jobs. Mostly because they are now unable/unwilling to do theirs.

2. People are inflexible. If I named everyone I knew in real life who was capable of working on a Mac and a Windows environment I wouldn't use up all 10 fingers.

The same way gentrification hurts the poor by placing their homes out of their living means, so to do we hurt the "plebs" by simply forcing them off their Apple products.

thewolfkin

Breaking down LTE spectrum

I WANTED TO commend the author on an excellent article. I read it in the print version of *Network World* and learned a great deal (Re: "LTE spectrum: How much do the big carriers have?" tinyurl.com/7nnwc38).

I consider myself a complete layman when it comes to wireless spectrum. I appreciated the author's explanation of why AT&T was trying to purchase T-Mobile. Previously I was completely against the idea, thinking that it was the Death Star trying to assimilate the competition (sorry for mixing metaphors), but now I realize that AT&T was struggling to purchase bandwidth.

Charles Waters

Network of the future

I AM LOOKING forward to the day that the network is no longer geographical, and when boundary devices such as routers and firewalls exist in the cloud (Re: "Highly anticipated net virtualization startup Nicira exits stealth mode"; tinyurl.com/8xjmsuy).

This will be the day when users can boot their laptops (into a secure encrypted virtual machine) at a hotel and authenticate on the corporate active directory (or its replacement), all seamlessly without ever launching a VPN or other connector program. Where subnets and security will be based on role rather than geography.

David Lapham

AT&T users' 'unlimited' data

SURE, AT&T HAS "no legal obligation to support unlimited data"... I'm sure the company verified that with its lawyers before it began reneging on its offer. Integrity is not legally required by any company unless it wants to keep loyal users loyal (Re: "AT&T users report getting throttled at 2GB despite 'unlimited' data plans"; tinyurl.com/7qkuqp6).

While I admit it would have still been a difficult pill to swallow, I would much rather AT&T officially discontinued the unlimited data plan altogether, forcing me to change plans legitimately, rather than intentionally deceive me with false promises. Those false promises are what convinced me to select its product in the first place.

Robert Corwin

Integrity is not legally required by any company unless it wants to keep loyal users loyal.

Best UC solution?

THE MOST TELLING part of this analysis is the line "the phone drives much of the decision" for voice. Straight from "1984," looking at the past instead of the future (Re: "The When, Where and How of Cisco vs. Microsoft for Unified Communications"; tinyurl.com/8yb6rmy).

Voice is just one more way to communicate, and organizations see reduced voice usage once they deploy integrated IM, conferencing, voice and email solutions.

Video? Still waiting for end users to adopt and use it at the desktop level. All hype, no traction. Seeing a person is less important than seeing the content to collaborate on. A UC solution without native, integrated Web conferencing is missing the most integral part of a UC solution.

Andrew Ehrensing

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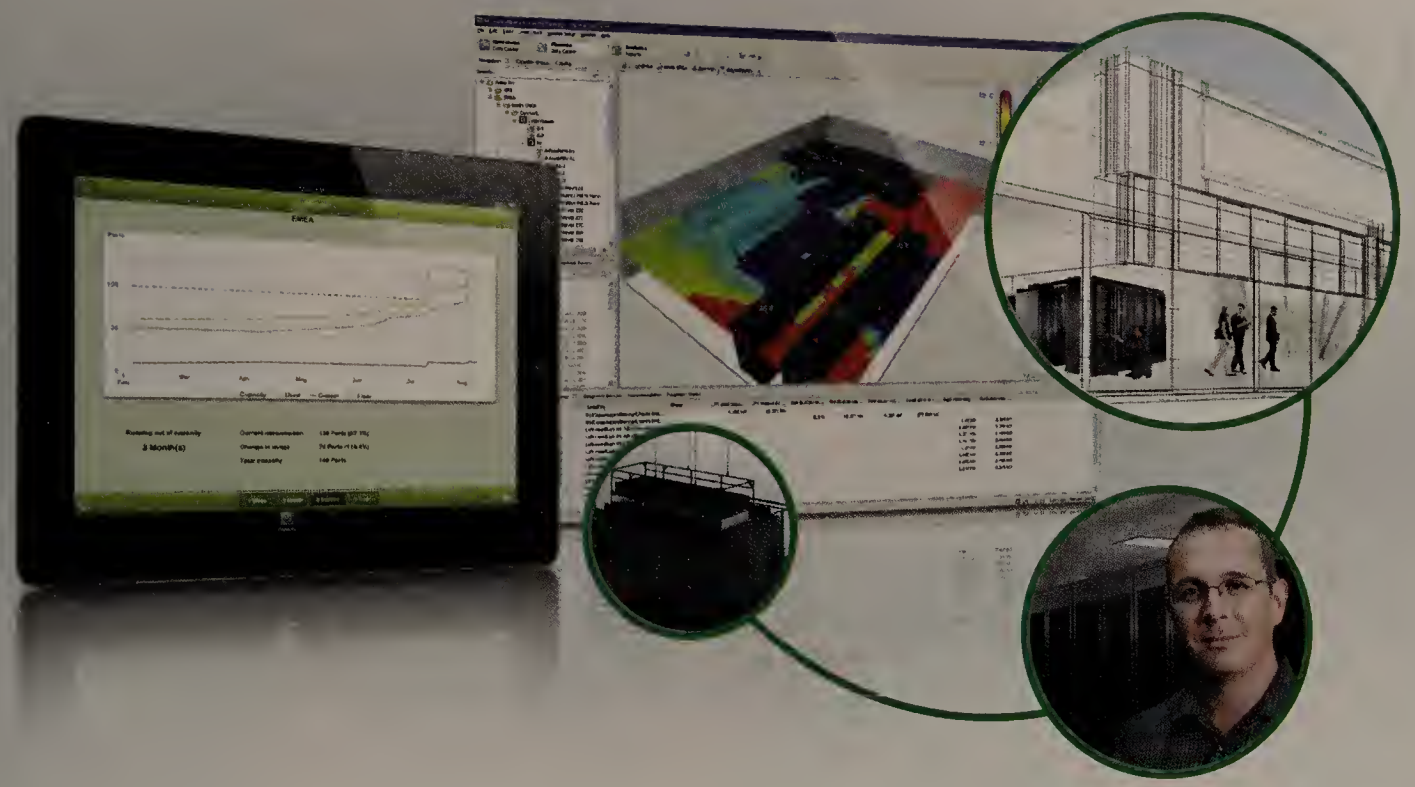

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bits

Google Chrome knows where you're going

FIRST CAME AUTOCOMPLETE, now get ready for auto-page rendering. The latest version of Google's Chrome browser, known as Chrome 17, can determine which sites you're likely to visit when you start typing them into your search bar and will preload them for you to reduce rendering time. Google software engineer Noé Lutz compared the new feature to a local deli that pre-makes sandwiches because the workers know you order the same thing every day. The other big attraction of Chrome 17 is its improved security features that include cross-referencing all executable files with a whitelist of safe files. If the files aren't on the whitelist, Chrome uses Google's search capability to check whether the website you're getting the file from has been flagged for hosting malware. ***tinyurl.com/7f9t3ev***

IT salaries climb, bonuses bounce

AFTER TWO straight years of flat wages, tech pros finally got a bump in 2011. The average wage for tech and engineering pros climbed 2% to $81,327 last year from $79,384 in 2010, according to salary data from Dice.com. Workers lucky enough to get bonuses saw an even bigger boost as the average bonus amount rose 8% to $8,769. Stiffer competition for tech pros contributed to the compensation gains. While the national unemployment rate is roughly 8.5%, the unemployment rate among tech professionals is 3.6%, says Tom Silver, a Dice senior vice president. Across the U.S., 12 of the top 20 cities for tech jobs had above average wage growth. Salary growth was strongest in Austin, Texas, where wages climbed 12.7% last year. Another metro area that saw particularly strong salary growth is Portland, Ore., where salaries grew 12.3% year over year. ***tinyurl.com/79jz52g***

Cisco profit surges on higher sales, lower costs

CISCO POSTED year-over-year gains in revenue and profit for its fiscal second quarter, reporting sales up 11% to $11.5 billion and net income up 44% to $2.2 billion. The company also said it met a key cost-cutting goal ahead of schedule. "We are executing well on our three-year plan to drive earnings faster than revenue," CEO John Chambers said in a statement. "We hit our billion-dollar expense reduction a quarter early." Sales of the company's UCS server lineup grew significantly in the second quarter, with revenue up 91% from a year earlier and an accumulated customer count of 10,763. Routing and switching revenue each grew 8%, while revenue from service-provider video infrastructure, another key focus at Cisco, grew 23%. ***tinyurl.com/74wxuap***

IBM boosts storage speeds, unveils iPhone app

IBM BUFFED up its flagship grid-based XIV Storage System by unveiling several upgrade options, including the option of using solid-state drives (SSD) as cache to boost performance by 3X. All well and good, but IBM competitors NetApp and EMC have been offering SSD caching options for their arrays for a year or more. In addition to the caching option, IBM added the ability to mirror data between previous versions of XIV and its current XIV Gen3 systems, which it said will ease data migration and allow customers to repurpose their XIV models as disaster recovery backup systems. IBM also announced a new Apple iPhone app that lets administrators monitor XIV storage environments through a web-browser interface. ***tinyurl.com/7dv89k1***

IT VIDEO

Marshmallow fun with President Obama

Along with the help from Joey, an eighth-grader from Arizona, U.S. President Barack Obama loaded a homemade rocket launcher and fired it inside the White House. ***tinyurl.com/7cxhl2h***

Anything SAP can do, Oracle can do, umm ... too

ORACLE SCOOPED up cloud-based talent management and employee recruitment software vendor Taleo for roughly $1.9 billion shortly after SAP's $3.4 billion bid to acquire SuccessFactors, a close competitor of Taleo. Some 5,000 enterprises use Taleo's software, which is used to handle 15% of employee hires in the U.S., according to Oracle. It remains to be seen how Taleo's portfolio will be aligned with Oracle's Fusion HCM (human capital management) software, which is also available as a cloud offering. According to Forrester Research analyst Paul Hamerman, the overlap with Fusion HCM is not that significant, since it currently lacks recruitment, learning and succession planning capabilities, all areas where Taleo is strong. "It's actually a pretty complementary fit." ***tinyurl.com/7r9zb4x***

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GOOD BAD UGLY

iPhone meets Lazer Tag

good

HASBRO HAS announced plans to update its Nerf Lazer Tag system in August so that you can link up your blaster with your iPhone or iPod Touch. You'll be able to slot your Apple device into your plastic gun and download an app to get a heads-up display of your power level, new weapon powers and your standing on a global leaderboard, among other things.

FTC targets background screening apps

bad

THE FEDERAL Trade Commission last week said it sent letters to six unidentified mobile applications makers warning them that their background screening apps may be violating federal statutes. Specifically the FTC said if the app makers have reason to believe their background reporting apps are being used for employment screening, housing, credit, or other similar purposes, they must comply with the Fair Credit Reporting Act which is supposed to protect consumer privacy and ensure that the information supplied by consumer reporting agencies is accurate.

Under DDoS attack

ugly

BOTH THE number and volume of distributed denial-of-service attacks are increasing, according to new reports from DDoS mitigation companies. During the fourth quarter of last year, Prolexic detected 45% more DDoS attacks compared to the similar period of 2010 and more than twice the number of attacks observed during the third quarter of 2011. There's a trend toward a shorter attack duration, but a bigger packet-per-second attack volume, said Paul Sop, Prolexic's CTO. This trend is reflected in a report from Arbor Networks which surveyed 114 people about their experience with DDoS attacks in 2011. Over 40% said they experienced attacks that exceeded 1Gbps in bandwidth last year, while 13% said they were the target of at least one attack that exceeded 10Gbps.

Microsoft wants Windows 8 to sip the juice

IN AN effort to prolong battery life, Windows 8 has been trained to be stingy when it comes to doling out power to applications, particularly Metro-style applications written specifically for the operating system. Microsoft developers say they let active applications grab the resources they need but strip down resources used by applications standing by. Power scrimping extends to the operating system itself through an effort the company calls power hygiene. The goal is to balance this economy with functionality, so, for example, applications finish tasks they have started even if users switch to something else. The upside for users is they won't have to limit the number of apps running at any given time and can expect them to respond immediately when they are switched to. ***tinyurl.com/6necelz***

Kelihos, the undead botnet?

CONTRARY TO reports, the Kelihos botnet has not crawled out of the grave. But Microsoft acknowledged that a new botnet is being assembled using a variant of the original malware. The reappearance of a Kelihos-like army of hijacked computers shows just how difficult it is to eradicate a botnet, security experts say. "It's not possible, in most cases," says Roel Schouwenberg, a senior researcher with Kaspersky Lab. "What you're going for is disruption more than anything." Liam O Murchu, manager of operations at Symantec's security response team, agrees, saying there is only one way to ensure a botnet's death. "If you get to the people behind it [through arrests and convictions], that will be the most successful. But international borders and the lack of cross-country cooperation make that a difficult road to go down." Kelihos was taken offline last September when Microsoft, using a federal court order, led efforts to shut down domains used by the Kelihos command-and-control system, severing links between the compromised computers and the order-giving master. ***tinyurl.com/7tvokfe***

FBI unbolts Steve Jobs 1991 investigation file

THE FBI last week released a background check it did on Apple's founder Steve Jobs when he was being considered for a position on the President's Export Council under George H.W. Bush in 1991. The 191-page document, released under the Freedom of Information Act, includes documents related to a 1985 investigation of a bomb threat against Apple and a host of other observations, many of them not surprising — he was strong willed, stubborn, hard-working and driven. Not all of the observations were flattering, however. Several individuals questioned his honesty, stating that Jobs will twist the truth and distort reality in order to achieve his goals. ***tinyurl.com/7cymus8***

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Mobile management: Apple's extra requirement

BY ELLEN MESSMER

ANYONE WANTING to buy mobile-device management software to manage Apple iOS devices will find they need a special digital certificate from Apple to activate it, a requirement that doesn't apply to the same MDM software that would be used to manage Google Android devices, for instance.

MDM software — such as that from MobileIron, Good Technology, Sybase, AirWatch, McAfee, Symantec and several others — is loaded onto mobile smartphones and tablets to allow IT managers to keep track of employee equipment, to remotely wipe these devices and to apply security controls. Enterprises buying MDM software to manage Apple iOS devices are sometimes surprised to find out about the Apple digital certificate requirement that they must obtain.

When design firm Holly Hunt decided to manage its Apple iPads with BoxTone MDM software, IT managers there found out they had to apply to Apple for a signed digital certificate for the MDM software in order to activate it. "It was a long process, but now we're a licensed Apple software developer," says Neil Goodrich, director of business analytics and technology at Holly Hunt. The application process took more than a month and resulted in a signed digital certificate that not only activated the BoxTone MDM software to manage the firm's Apple devices, but also gave Holly Hunt the right to create its own iOS apps.

However, enough people last year found this particular Apple MDM certificate-issuance process cumbersome, so in September 2011 Apple changed it, explains MDM vendor AirWatch. (Apple did not respond to an inquiry asking for clarity on why it demands the signed digital certificate for MDM.)

Blake Brandon, technical consultant at AirWatch, says the older certificate-issuance process with Apple used to cost $300 but the simpler process today is free. He says now the Apple MDM digital-certificate issuance process only takes a few days at most. But what you get now does not include the Apple software developer license but only what's called the "Apple Push Notification Service" (APNS) certificate. (To get the Apple software developer license, you now have to apply separately and go through what is a more involved registration process.)

Apple does require the APNS digital certificate to use any vendor MDM software with Apple iOS 4.0 and 5.0 devices and getting that certificate signed properly takes a few steps, Brandon says. AirWatch has instructions on how to do this on its site. (There are also a lot of instructions still lingering and there across the Web for the older Apple MDM certificate-issuance process.)

The MDM enterprise customer first has to digitally generate a certificate on its own, and then get it digitally signed by both the MDM vendor and Apple. This digitally signed certificate process, typically done over the Web, results in a signed certificate that is then loaded into the server associated with the MDM software, he says.

Neither Google Android devices nor other brands have to go through this certificate-signing process for the same MDM software, acknowledges Brandon. Nevertheless, he argues the Apple certificate requirement, which started in June 2010 with iOS 4.0 when Apple introduced its MDM APIs, is a good idea. He says it gives Apple a way to have control over what works well on Apple iOS devices in terms of battery and other factors. Indeed, this is the same argument that Apple makes on its website in describing the digital-certificate issuance process. ■

Tech event in March

IT Roadmap Chicago focuses on the trends and technologies that are most relevant to you. At IT Roadmap you will learn what solutions are best for your organization.

tinyurl.com/82g6mp9

Centrex: It's alive (for now)!

BY BRAD REED

CENTREX IS a lot like the talking plague victim from Monty Python's "Holy Grail": It's not quite dead yet.

Joan Moyer, president of the end user-run nonprofit International Telecommunications Professionals Exchange (ITPX), says Verizon and AT&T combined have more than 10 million analog Centrex lines still active across North America. This is, of course, way down from the estimated 16.5 million analog Centrex lines that were active in the United States in 2002, but it's still a significant figure.

Centrex has been around since the 1960s when it was developed by New York Telephone as a substitute for PBX switchboards in large enterprises. Companies were initially drawn to Centrex because it meant they didn't have to dedicate in-house staff to running the telephone system and could instead rely upon the phone company to do it for them. But with the advent of hosted VoIP services in recent years, Centrex has largely fallen by the wayside for many enterprise users.

In fact, the ITPX used to be known as the National Centrex Users Group before changing its focus to cover both Centrex and more modern technologies such as VoIP. Moyer says the group, which is holding its yearly conference and trade show in Las Vegas on April 23, now does a lot of work in helping members make the transition away from analog-based Centrex.

Even so, Moyer says many members of her organization, particularly government agencies, still use Centrex for their telephone exchange system even as they plan to eventually migrate over to a VoIP system.

"A lot of federal government agencies are big users of Centrex, as well as large enterprises with multiple locations," she says. "Because Centrex is hosted it's easy to put a seamless system across multiple locations."

Moyer does acknowledge that most ITPX members aren't planning on staying with analog Centrex forever and are likely to shift gradually over to a hosted IP-based service instead. However, she says Centrex is still meeting its hosted telephony needs at a low cost since "all the equipment" for Centrex "has been purchased and paid for" and agencies aren't spending money to hire people in-house to maintain it. And besides, she notes, "a lot of the time ... government people don't want to be on the bleeding edge of technology because if the system goes down, you've got problems." All told, Moyer expects that Centrex will likely still be with us for the next 10 to 15 years.

Irwin Lazar, an analyst at Nemertes Research, says he rarely sees Centrex being used by large corporate enterprises. However, he says Centrex still has a place at many large universities that just need a system to deliver basic voice services. ■

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Lync-Skype integration a 'compelling opportunity'

BY JUAN CARLOS PEREZ, IDG NEWS SERVICE

MICROSOFT IS looking at creating a bridge between Lync, its enterprise IM, voice and video communications product, and Skype as part of its broader initiative to extend the Office platform, a company executive said last week.

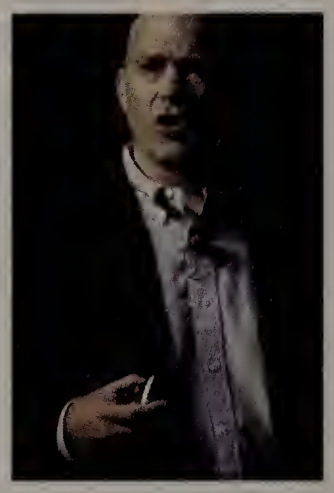
Microsoft, which closed its $8.5 billion acquisition of Skype in October of last year, views the massively popular IM, Internet telephony and video chat consumer service in part as a vehicle for connecting enterprise Lync users with consumers, according to Bill Koefoed, Microsoft's general manager of investor relations.

"We think [Lync] is a big opportunity. Part of the reason why we love the Skype acquisition is because when you think about the integration between Skype and Lync, between the enterprise and the consumer, it ends up being a pretty interesting opportunity as we go forward there," he said at the Stifel Nicolaus Technology & Telecom Conference.

Koefoed, whose appearance at the conference was webcast, acknowledged that Microsoft hasn't spent a lot of time yet talking about its road map for Skype, but made it clear that integrating it with Lync is in the works.

"Enabling an enterprise to talk to a consumer via the Lync-Skype integration would be something you'd think we'd be looking at, for sure," said Koefoed, who answered questions from a financial analyst and from audience members.

Microsoft offers an on-premise version of Lync that has both a server and a client component, as well as a cloud-based version called Lync Online that has a subset of the functionality and is available as part of the Office 365 cloud collaboration and communication suite.



Microsoft's Bill Koefoed: Lync and Skype could connect enterprises with consumers.

Asked for comment about Lync and Skype, a Microsoft representative said via email: "Lync and Skype are not integrated today. So while we have nothing formal to announce today regarding Lync and Skype, we're incredibly excited about the opportunities to extend the value of Skype to other Microsoft products and services."

Another Microsoft official made a reference recently to plans to broaden the integration between Lync Online and consumer IM networks. At ITExpo in Miami last week, David Grider, a Microsoft Lync technology specialist, said that Microsoft plans to make Lync Online interoperable with non-Microsoft IM networks. Lync Online is currently integrated with Microsoft's consumer IM service Windows Live Messenger, but not with others like Yahoo Messenger.

Lync Server 2010, however, does feature IM and presence federation with XMPP-based networks like Jabber and Google Talk and with other consumer networks such as Yahoo Messenger and AOL Instant Messenger (AIM).

When asked to name Microsoft products he is particularly bullish about, Koefoed mentioned at the top of his list Office 365, which Microsoft announced in late 2010 and began selling in June of last year as a competitor to Google Apps and other cloud-based communication and collaboration suites. ■

Microsoft mobile CRM clients on the way

BY TIM GREENE

THE PRODUCTIVITY of salespeople could jump with the upcoming release of native Microsoft Dynamics CRM applications for specific mobile platforms and put the software vendor ahead of some of its competitors, an expert says.

CRM applications on mobile devices already improve productivity 14.6% for sales staff that use them, says Rebecca Wettemann, vice president of research for Nucleus Research, and these native apps should work that much better on their respective platforms, she says.

Microsoft has announced that next quarter it will release native Dynamics CRM clients for its own Windows Phone 7 as well as Android 2.2, BlackBerry and Apple's iOS.

With native apps customized for each platform, the look and feel of the application on each device should improve over what it would be with a generic client, Wettemann says.

"I wouldn't say they're out in front, but native clients out of the box is pretty advanced," she says, adding that no vendor has delivered native apps for all these platforms yet, but that eventually "we're going to see all vendors doing model-specific clients."

She says this development is necessary for Microsoft because ease of use is important to CRM customers that want support for mobile devices, and native clients will be a step in that direction. For example, a December 2011 case study by Nucleus says that Kimberly-Clark had to develop its own custom Salesforce CRM applications for iPads in order for its field salespeople to use the service.

Mobile devices are enormously popular among salesforces: The iPhone is the most commonly used device for accessing CRM, Wettemann says, with 67% of CRM users using their iPhone to access some CRM application. With the increase in businesses that allow personal devices to be used for corporate purposes, the number of devices that need CRM support is constantly increasing.

From a management perspective, a single client that would perform with equal effectiveness on multiple devices is most desirable, but that will take some time to develop.

With the longer term in mind Microsoft says it is working on an HTML5 client that fits the bill of working well on all platforms.

The new native applications for Dynamics CRM will come as part of a regular update to Microsoft's Dynamics CRM offerings. With the initial release, users will be able to work offline with data they have downloaded to their mobile devices, and they can synch the devices with other devices online.

While the new clients grab most of the attention, the latest update of Dynamics CRM includes a server component that includes management and security. One feature can wipe sensitive corporate data from devices if they become lost, stolen or compromised.

Dynamics CRM costs $30 per month per user, and each license covers three devices and includes the full set of server features. ■

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How to protect online transactions

BY JULIE SARTAIN

THE TRUSTY telephone is emerging as one of the key elements in new multifactor authentication schemes designed to protect online banking and other Web-based financial transactions from rapidly evolving security threats.

New federal guidelines, which took effect last month, recommend multiple layers of security controls beyond the traditional username/password, particularly out-of-band authentication methods.

While the Federal Financial Institutions Examination Council (FFIEC) rules apply specifically to banks, credit unions, mortgage lenders and savings and loans, every organization that deals in online financial transactions, such as shopping portals, credit card companies and online bill payments, is affected.

One of the main weapons in the today's hacker arsenal is password phishing. In this scenario, hackers use phishing emails to steal online banking credentials and break into user accounts.

In response, banks and other financial institutions have deployed technologies like device identification, challenge questions and one-time password tokens, according to Sarah Fender, vice president of product management at authentication vendor PhoneFactor.

Forrester analyst Andras Cser emphasizes that login IDs and passwords are no longer enough. He says preselected images, challenge questions, device information and device reputation are all effective second-factor authenticators.

But the problem with many of those "in-band" authentication methods is that the device itself might be infected with malware, adds Fender.

Plus there are more advanced threats, such as keyloggers, man in the browser (MITB) and man in the middle (MITM) attacks, which require even more sophisticated security measures.

Gartner analyst Ant Allan says, "Virtually every authentication technique can be compromised or circumvented. Authentication is better than legacy passwords to minimize the risk for 'quick and dirty' attacks such as phishing, but there is a limit to the utility of seeking higher-assurance methods that are harder to compromise directly. At some point, the attackers will move to MITB attacks, which hijack already authenticated sessions, effectively bypassing authentication, to manipulate transaction details or insert bogus transactions."

Allan says there are two advanced technologies that are effective in combatting the current crop of attacks: Web fraud detection and transaction verification.

According to Allan, Web fraud detection evaluates contextual information about the user's connectivity (endpoint identity, geographic location and so on) and looks for anomalous transactional behavior (compared to user history and to other users; e.g., are multiple users making transfers to the same new account?).

Transaction verification uses a number of techniques to confirm that the transaction details received by the bank (a) originated with the user and (b) are what the user intended. Interactive transaction confirmation via an out-of-band method, as outlined in the FFIEC guidance, is effective for desktop browser sessions and is possibly the most attractive option.

Of course, there are even more robust security methods — OTP (one-time password) hardware tokens with PIN pads and the EMV (Europay, MasterCard, Visa) payment card readers — but banks have run up against customer resistance to these types of security measures.

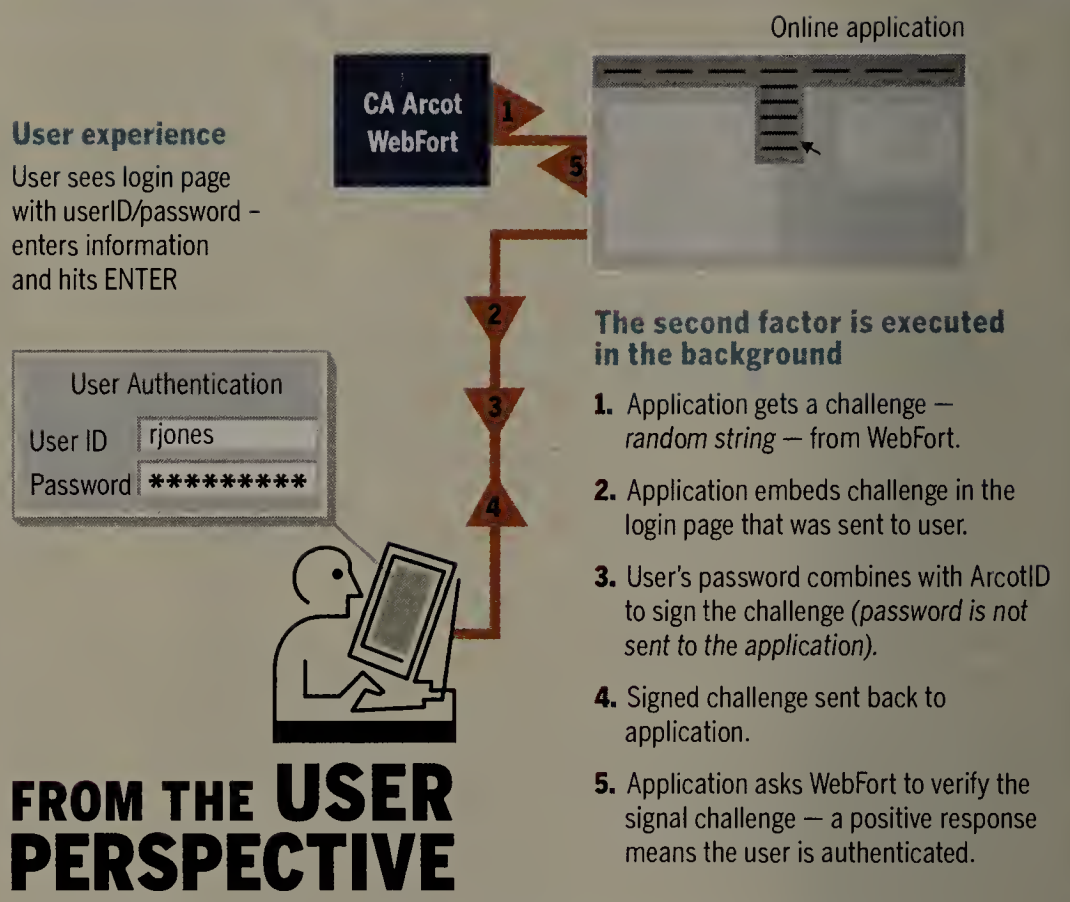
Here are some of the current options for effective authentication of online transactions.

Risk-based authentication: An example of risk-based authentication is CA Arcot's RiskFort, a sophisticated tool that incorporates analytical fraud models based on a statistical analysis of transaction and fraud data.

"RiskFort collects a wide range of data about each login or transaction to produce a risk score derived from analytics and rules," says Ram Varadarajan, general manager at CA Arcot Security solutions, CA Technologies.

He adds, "The risk score determines what action, if any, to take for a given transaction, such as requiring a higher form of authentication. This is a scenario where risk-based authentication works collaboratively with strong authentication. If a transaction appears suspicious, another factor of authentication can be invoked to 'step up' the authentication and security."

Versatile authentication platforms: Entrust offers IdentityGuard and TransactionGuard. "IdentityGuard handles strong authentication in breadth as well as depth. It supports hard tokens, soft tokens, smart cards, SMS tokens, geolocation, eGrids and more. Authentication could be relatively



FROM THE USER PERSPECTIVE

With the CA ArcotID secure software credentials, users gain improved security of multifactor authentication without changing their familiar username and password login experience.

simple for clients using their own computers from their own homes, but increases in depth if they are using a hotspot, and even more if they are in another country," says Jon Callas, CTO at Entrust.

One improved technology is Entrust's patented electronic grid (eGrid), a simple, two-factor authentication system that requires little to no supporting technology. It's a grid of two-character codes indexed by letters and numbers. A bank can ask a user, for example, to provide the codes for E4, A1, H3. The user looks them up on his/her eGrid and replies CX, G3, 23 (which is, obviously, different on every card), and if the corresponding table matches, then the authentication is correct.

"Note that it doesn't require users to have a smart card, a token or any other supporting technology," adds Callas. "It can be printed, kept as a picture, embossed on a badge or almost anything else. I have one that's a picture, which I keep on my iPhone, and I use it to authenticate to Web mail."

Phone-based authentication: "Phone-based authentication is swiftly becoming the method of choice," says PhoneFactor's Fender. "These systems leverage the user's telephone as the trusted device for the second factor of authentication. Telephones are extremely difficult to duplicate and phone numbers are extremely difficult to intercept. The combination of the phone and a username with password yields strong, multifactor authentication with minimal impact on the user experience."

She adds, "PhoneFactor users can choose whichever authentication method they prefer such as phone call or text message, and all these solutions provide the same level of out-of-band security and convenience. Additional security features include PIN mode, voiceprint and transaction verification, which can be mapped to particular users and/or levels of risk."

Image-based authentication: One clever, new technology by Confident Technologies uses images on a touch-screen phone for authentication. Unlike multifactor authentication processes that send a one-time text message pass code to the user's phone, this technology provides a secure second factor by encrypting a one-time pass code within an image-based authentication challenge.

"When an authentication requirement is triggered, users identify pictures on their phone screen that match their previously selected, secret categories," says Curtis H. Staker, CEO at Confident Technologies. "For example, if a user preselects the categories called cars, food and dogs, a grid of 12 (or so) images appears that contains various images, three of which fit their categories, such as a Corvette, a hamburger and a beagle. By correctly identifying the pictures that match their secret authentication categories, users are, essentially, re-assembling the one-time pass code that was encrypted within those pictures. Importantly, the process remains completely out-of-band from the Web session."

"This concept of image categories is intriguing," says Scott Crawford, managing research director at Enterprise Management Associates. "Particularly for mobile or touch-screen form factors (where text input can be a challenge) and for cross-cultural or multi-language use cases, but the technique may beg the question as to whether or not users can consistently remember the categories they have chosen."

Staker adds that the specific images displayed are different every time, but the users' categories always remain the same. "This makes it difficult for anyone else to determine the users' secret categories. Even if someone else gained possession of the mobile phone or intercepted the communication, they would not be able to authenticate because the one-time password is encrypted within the images," adds Staker.

Biometrics: Biometrics include authentication properties such as face recognition, fingerprint identification, hand geometry biometrics, retina scan, iris scan, digital signatures and voice analysis.

"I'm not sure if biometrics is considered new, but it's definitely improved, and it's an area that ebbs and flows, as far as interest is concerned," says Chris Silva, mobile industry analyst at Altimeter Group. "The newest buzz in biometrics that's garnering attention in the mobile space is facial recognition. It has a lot of promise for the devices that we all carry around with us, which have limited physical keyboards (or none at all) and often need to be accessed while we're multi-tasking."

Many companies are experimenting with biometrics as an additional layer of security; for example, PhoneFactor uses Voiceprint Verification as a third factor of authentication on top of its other offerings.

Summary

As everyone in the security business knows, there is no perfect answer. Allan points out that "whatever the desirable level of assurance, it has to be balanced against cost (deployments for hundreds of thousands of users are very cost sensitive) and user experience. We know that bank customers may change their banks if new security features such as authentication degrade the user experience: In a survey a couple of years ago, Gartner found that 3% of customers had done so, and a further 12% considered it," adds Allan.

Sartain is the author of "Data Networks 101" and a freelance journalist from Salt Lake City, Utah. She can be reached at julesds@comcast.net.

TOOLS

NeuroSky MindWave: Fun with brainwaves

In last week's Gearhead I discussed, in part, the science of electroencephalography or EEG ... the detection and measurement of the neurological activity of the brain via electrodes attached to a subject's scalp. Last week's EEG electrode platform was built into a cap. This week I have a system that detects both EEG and electromyography signals (or EMG), the latter being the signals generated by muscles.

Mark Gibbs' Gearhead

The NeuroSky MindWave headset makes you look like you're auditioning for "Star Trek," although the design is more "Next Generation" than classic "Star Trek."

The MindWave has two dry sensor contacts, one that touches your forehead and another that clips onto your left earlobe.

The MindWave headset communicates with a computer via a USB-interfaced "dongle" and requires driver software to be installed on the host system.

The driver software is straightforward to install under Windows (I used an HP laptop running Windows 7 Home Ultimate) and, while not hard under OS X (I used it on an iMac running OS X 10.7.2), it is a slightly clumsier process requiring you to run two downloads, one after the other in order.

After the drivers are installed you have to run the MindWave Manager application to register the MindWave headset with the computer. Once registered, the ThinkGear Connector, another driver that bridges between the USB driver and MindWave-enabled Flash applications, is loaded (it is configured to load automatically when Windows or OS X starts). There's also yet another driver, the CogniScore Connector, that tracks your achievements with applications that exercise and test your mental abilities and file their assessment of your skills with the "connector."

Really? Couldn't all of this architecture be hidden from the user and the MindWave Manager and the CogniScore Connector be built into the ThinkGear Connector?

Anyway, you can download a variety of MindWave-enabled applications created by both NeuroSky and third-party vendors from the NeuroSky store. Some of these applications are free while others are seriously spendy (intended for academic and business use).

In the free category are a number of games. For example, there's "blink/zone," a game in which virtual fireworks are launched from the bottom of the screen and how high they rise is dependent upon how focused (attentive) you are. When each firework reaches its maximum height you are supposed to blink to make it explode and the higher each explosion is, the more points you get.

What this and many of the other MindWave-enabled games are doing is to train your ability to concentrate and simultaneously relax using biofeedback. Biofeedback is defined on Wikipedia as "the process of becoming aware of various physiological functions using instruments that provide information on the activity of those same systems, with a goal of being able to manipulate them at will. Processes that can be controlled include brainwaves, muscle tone, skin conductance, heart rate and pain perception."

If you want an interesting visualization of your mental state I recommend the free Sekati Brain-Computer Interface featuring a field of blue balls.

The author, Jason Horwitz, says when your brain waves become readable the clue balls "snap in to focus. When the waves become focused & reach above a certain (configurable) threshold, gravity is removed ... and the balls begin to float to the top of the screen like balloons (conversely a loss of focus reapplies gravity & the balls drop like rocks). The user may also control the direction in which the balls travel with the type of thought used; focus & concentration forces the velocity of the balls to the left, whilst a more relaxed, passive, observant state of mind forces the balls to the right (keep in mind; this is not mind-control; but rather advanced biofeedback -- & in practice is a lot like using muscles you did not know you possessed)."

The benefits of biofeedback training are well established and, at $99.95, the NeuroSky MindWave is, by far, the lowest cost and most data-rich EEG/EMG system available with which to do it. It's just begging for you to develop that killer application!

The NeuroSky MindWave gets a Gearhead rating of 5 out of 5!

Your thoughts to gearhead@gibbs.com.

The NeuroSky MindWave headset makes you look rather like you're auditioning for "Star Trek," although the design is definitely more "Next Generation" than classic "Star Trek."

Jared Mittleman
CTO, AG SEMICONDUCTOR

Jared Mittleman has been Chief Technology Officer of AG Semiconductor Services since 2007. He oversees IT and handles business analysis, project management and strategic direction. He also oversees direct development and infrastructure projects utilizing both internal and external resources.

FOR MORE INFORMATION:
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AG Semiconductor employees have peace of mind regardless of location with Evault.

At any given moment, AG Semiconductor's 40 employees can be spread across a dozen countries, some with intermittent Internet connections and all with varying bandwidth. With employees saving most of their files to their laptops, AG Semiconductor needed a backup and recovery solution that would ensure backup of its laptops and servers regardless of users' locations. That's when it turned to EVault Express Recovery Appliance SaaS.

What appealed to you about cloud-based backup and recovery from EVault?
There are three aspects. First, I don't have to deal with the infrastructure. The entire infrastructure, not just the data storage costs, is fairly expensive to maintain, and it has to be reliable or it doesn't have much value. We're a small company; our value is better served by making the company better and not by making sure the backup servers are continually running.

The second aspect has to do with the distributed nature of the company. We have facilities in three countries, with people operating in a dozen different countries right now. An infrastructure that can support them is more expensive, more difficult to maintain and very difficult to implement when you don't have a local presence. So we looked for someone who had that capability.

I also wanted a solution that was secured via the Internet so that no matter where someone was in the world, as long as they have an Internet connection they also have a backup connection. Most of the other technologies we were looking at were designed for environments where everyone is sitting in one office with a LAN. Companies designing backup for the cloud are designing for periodic connections. It's a different dynamic than designing for on-premise solutions.

How does EVault help you achieve your business goals?
We send people around the world to work with our customers. EVault means that I don't worry about backup when someone goes to China or Russia. As long as employees can get Internet access for a small period of time, they are safe. They don't have to carry an extra hard drive, and I don't have to remind them to backup it regularly. Backup isn't a user's responsibility anymore, it is automatic and seamless. IT only gets involved when there is a problem.

How would you describe your backup and recovery before and after EVault?
Our prior backup solution worked domestically but very poorly internationally. We've been able to use EVault worldwide, and that has huge value. Before EVault, the backup and recovery process was cumbersome. With our previous solution we had to use the individual's last backup combined with attachments they emailed, combined with documents from coworkers and reconstituted data. Backup and recovery wasn't simple or streamlined. Now it is—EVault works. We haven't had a single major problem since we rolled it out to 40 laptops and close to a dozen servers. It just runs and does its thing. We're very comfortable with it.

What has your experience been with EVault tech support?
They've been absolutely fabulous to work with both pre- and post-sale. When we send EVault a question, we get an answer quickly, 24 hours a day. A number of people on the support staff have helped us immensely over the past year.

GADGETS

Toshiba's 1TB USB 3.0 drive; winter gloves for touch-screening

Keith Shaw's Cool Tools

THE SCOOP

Canvio 3.0 Plus external hard drive

by Toshiba, about $180 (1TB version)

▶ **What it is:** The latest external hard drive from Toshiba features 1TB of storage capacity, a USB 3.0 connection (with USB 2.0 support), a free 30-day trial of cloud backup software, file/folder data encryption (256-bit, via password protection), an internal shock sensor to protect it from drops, and a drive space alert system that tells you if the drive is full.

▶ **Why it's cool:** Compared with USB 2.0 drives, the USB 3.0 interface will allow for speedier file data transfers between your PC and the drive — in our tests we achieved between 85M-86MBps of read speeds, and about 53M-56MBps of write speeds — these aren't the fastest I've seen with USB 3.0 (the upper range is about 95M-100MBps), but they are faster than USB 2.0 drives.

▶ **Some caveats:** No Mac-to-Windows integration; while you can copy files from the drive to a Mac, you can't copy files from a Mac to the hard drive unless you reformat. Other drives I've tested (Seagate, in particular) include a driver that lets you copy Mac files to the Windows-based drive without reformatting.

▶ **Grade** ★★★★ **(out of five).**

THE SCOOP

Agloves touch-screen-enabled winter gloves

by Agloves, about $18

▶ **What they are:** We're in the middle of winter here in the Northeast, so I recently acquired a pair of winter gloves (mittens, if you want to get technical) that let you operate a touch-screen device (smartphone or tablet) without removing the gloves. The Agloves include tiny particles of silver woven into the gloves to help create the bioelectricity needed to operate the touchscreen.

▶ **Why it's cool:** Other winter gloves that attempt this either have a fingertip part that disconnects to expose your finger to let you use the touch screen, or they only allow for one or two fingers (usually the index finger and thumb) to operate the screen. With the Agloves, the entire glove becomes available for use, so you can operate a phone with your pinky, or even the back of your hand if you like. In my tests, I was able to unlock my phone, open up an app and even type some simple text messages while using the gloves. As long as the gloves fit (that is, they are tight enough to form-fit around the finger), you should be able to type just fine.

▶ **Some caveats:** While the gloves work fine in the "does it work?" department, the gloves are less warm when compared with leather or thicker gloves (for example, I wouldn't wear these during a wet snow event or when going skiing), but for everyday use, they're fine.

▶ **Grade** ★★★★½

Shaw can be reached at kshaw@nww.com.

techdebate

EXPERTS FACE OFF *on the* HOTTEST TOPICS

Are we winning the cybersecurity war?

We're out ahead

Chirantan "CJ" Desai, senior vice president of the Endpoint & Mobility Group at Symantec

WHEN WE ANNOUNCED THE DISCOVERY in October 2011 of the Duqu attack, a remote access Trojan that was a precursor to a future Stuxnet-like attack, the news made headlines worldwide as another example of just how sophisticated and insidious cyberthieves have become. Add Duqu to the other attacks and data breaches that received significant media attention in 2011 and it is understandable why there's a growing perception that attackers are winning the cybersecurity war, and that companies are helpless to keep their information and interactions safe.

That perception is incorrect. In fact, when you compare the handful of successful attacks to the millions that are thwarted every year, you find the cybersecurity war is extremely one-sided in favor of the good guys.

I don't want to downplay the significant risks attackers pose to organizations; a data breach can result in the loss of millions of dollars and irreparable damage to reputations. The sheer volume of attacks is staggering: In 2010 alone, Symantec blocked 3.1 billion attacks. That number is overshadowed by the few successful attacks that receive media attention.

Approximately 144,000 malicious files are detected each day. This translates to a rate of more than 4.3 million each month. This war against malware authors is constant and ongoing, similar to the ongoing war on crime. Security professionals are like the police — we don't expect the police to eradicate crime altogether, but they play a critical role in preventing criminals from winning that war.

That raises a critical point: Of those 3.1 billion blocked attacks, roughly half were stopped by intrusion prevention technologies inside of the organizations' endpoint security software — proving that while signature-based antivirus plays a critical role in preventing threats, it's no longer an exclusive role. Organizations must work closely with their security vendors and solution providers to ensure they have implemented the latest technologies to mitigate attacks. Vendors don't release new versions just to generate revenue; they do so because their older technologies become less effective over time.

Because the threat landscape is constantly

► *See* **Symantec,** *page 20*

We're losing the war

Steven Sprague, CEO of Wave Systems

SERIOUSLY, IS THERE EVEN REALLY any question about it?

Over the past year, the heads of the Nuclear Energy Regulatory Commission (NERC), the Defense Department's new Cyber Command and other top officials across government and industry have flatly stated that they can't protect their IT systems from unauthorized intrusion. U.S. intelligence agencies have actually named China and Russia as the main sources of cyberattacks and alleged which groups in China actually performed attacks — diplomatic and economic consequences be damned.

Cybercrime as an industry has posted growth numbers — the number and cost of data breaches, new malware and advanced persistent threats (APT), you name it — that would make Wall Street drool. What's more, the deluge of news written about data breaches represents only a portion of the problem. Current regulations require reporting the loss of only personally identifiable information, not other highly valuable intellectual property such as sales figures or product design data. That means data breach costs are actually much higher.

Not only are cyberattacks getting more sophisticated, frequent and expensive, but our national addiction to convenience and shiny new toys is making things worse. Key among these double-edged swords currently cutting us are cloud and mobile technologies and the consumerization of IT; we have gone from desktops and BlackBerries that have relatively good security to cloud services and Apple and Android devices that often don't. In all these cases, we lack the self-discipline to make information assurance and regulatory compliance necessary preconditions to securely adopting these promising technologies.

When we look at all these factors, saying we're winning the cybersecurity war becomes ludicrous. If this is winning, what would losing look like?

Our current IT security paradigm obviously doesn't cut it anymore. More and more, government and commercial best practices recommend adding an independently managed layer of hardware-based protection to any IT security portfolio. Increasingly, organizations that rely solely on software-based IT security aren't bringing even a knife to a gunfight — they're bringing a spoon.

If we're going to win the cybersecurity war, we

► *See* **Wave,** *page 20*

Are we winning the cybersecurity war?

Yes — 43%

No — 57%

Cast your vote and see comments at tinyurl.com/8yhxppw

▶ **Symantec,** *from page 19*

evolving, organizations need to be able to quickly and easily update their networks and endpoints with the latest operating system and application patches. Here's where security software has a distinct advantage over a hardware-assisted security solution, which is more difficult to update. With more than 286 million new threats found last year alone, previously unknown and highly sophisticated threats emerge on a regular basis, requiring solutions that are nimble enough to react and effectively thwart them.

New layers of protection technology are making an incredible impact. Reputation-based security stops mutating malware by analyzing and maintaining contextual data for billions of application files and assigning each a risk score. Complement this with a layer of real-time behavioral prevention to thwart targeted attacks. Additionally, policy-based intrusion prevention solutions provide solid defense for business-critical server workloads, without impacting performance. Each new technology steps up to meet the latest attacker challenge.

This comprehensive and effective approach gives organizations the freedom to choose best-in-class solutions and provides the speed and agility needed to respond to today's rapidly emerging security threats.

The onus is on security professionals to continually evaluate and update security postures to keep up with the bad guys. Advances made to technologies that used to be thought of as "nice-to-have," like DLP, encryption, intrusion prevention and reputation-based security, are making it much harder for the bad guys to get in and get stuff out. While it may be impossible to win the cyberwar, we are at least staying out ahead. ■

Symantec is a global leader in providing security, storage and systems management solutions to help consumers and organizations secure and manage their information-driven world.

▶ **Wave,** *from page 19*

have to move to a global "zero tolerance" policy for cybercrime and data breaches. Enacting a zero tolerance policy must start in government and industry board rooms and be pushed through public and private sector research, education and regulation. Key steps include:

- Every vendor needs to build in security by design (no more taping air bags to the dashboard) and the enterprise needs to invest in upgrading its security with built-in solutions. This includes paying real attention to information assurance instead of lip service, and rapidly implementing technologies known to counter evolving threats, such as Trusted Platform Modules (TPM) and device-based identity.
- We need to strengthen data breach notification laws to require disclosure and the penalties for noncompliance must be severe enough to make companies take notice.
- Government and industry alike must quit debating game plans and org charts and implement a shared strategy. We need to stop arguing about who deserves a first-class cabin on a sinking ship and start getting serious about fixing leaks.
- Likewise, government and industry should uphold the National Strategy for Trusted Identities in Cyberspace (NSTIC), which will create an "Identity Ecosystem" where people can choose among approved public and private suppliers of trusted credentials that prove their identity.

We're losing this war for cybersecurity, but we know how to win. We've got to ask ourselves: What are we prepared to do? ■

Wave Systems is a leading provider of client and server software for hardware-based digital security, enabling organizations to know who is connecting to their critical IT infrastructure, protect corporate data, and strengthen the boundaries of their networks.

Send Debate Suggestions to jdix@nww.com

The arms race

Mr. Desai's commentary is interesting for many of the reasons Mr. Sprague notes. Essentially, every successful attack is a lost battle independent of the status of the "war." Successfully remediating an attack after the fact still means the attack succeeded (even if it was "minor"); millions stolen, infrastructures taken down, identities or proprietary data lost, etc.

A better term for this "war" might be "arms race." Whoever gets the ultimate weapon first (or has the most diverse stockpile) will ultimately win — and until that time, sitting back happy in the knowledge that the successful-to-unsuccessful ratio remains in your favor is short-sighted.

There is a growing number of technologies being developed and deployed that can "see" the attack coming before it strikes, and these need to be a much more significant aspect of the "war" strategy going forward. That, and removing the unnecessary obstacles to getting them out in the places they need to be in order to stay ahead of the bad guys. **DAVIDMPOFF**

Who is winning?

I guess it's all in how you look at it. If we successfully thwart 99% of all attempted cyberattacks, is that considered winning the cyberwar? If just 1% of attempted cyberattacks are successful, you immediately have to ask, "How much damage resulted from the attack?" I just don't think it's as simple as blocking a certain number of attacks versus allowing a certain number of attacks. It's all in the severity of the result. **BRAD1505**

Security is too reactive

While I agree that we've seen good progress with only a handful of successful attacks compared to the millions that are thwarted every year, I find it hard to view that as validation we're winning the war. How many attacks go unreported or undiscovered? And how much damage is done by those attacks that succeed?

We increasingly rely upon digital infrastructure, and security is too often reactive, meant to minimize threats. Most security audits show glaring weaknesses, and it's not enough to patch only the issues ranking highest on the threat charts.

We need to be more proactive with security — building it directly into hardware and providing more layers of defense. Security is one of few areas where I agree MORE regulatory oversight is necessary, with greater penalties to force adoption of stronger security. There will never be a true victory in the cybersecurity war, and those fighting on the front lines need more budget, innovation and support to mitigate the damage. **MICHAEL SCHULTZ**

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IPv6 deployment starts at network edge

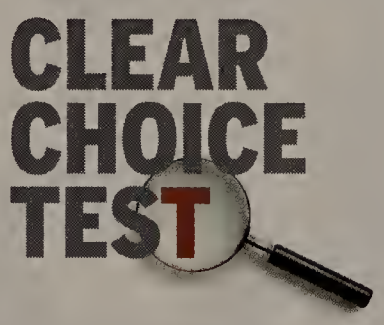
6 ADCs deliver IPv6 capabilities to apps hosted on IPv4 Web servers

BY SCOTT HOGG

IT execs know they will have to deploy IPv6 at some point, but where to begin? One approach that establishes some IPv6 capability without spending a lot of time or money is to start at the perimeter.

IPv6-enabling routers, firewalls and DNS servers should be straightforward. If an organization were to deploy an IPv6-capable server load balancer (SLB) or, using the most current term, application delivery controller (ADC), they could configure an IPv6 virtual IP (VIP) and an IPv4-only server farm.

This would allow Web apps hosted on IPv4-only servers to appear to the Internet user as IPv6 applications. The way it works is that clients would connect to the IPv6 VIP, and the ADC would perform a reverse-proxy function and terminate the IPv6 HTTP Internet connection, then create a new IPv4 HTTP back-end connection to the IPv4-only application servers. The server would not necessarily know the IP version being used by the client and it would happily return the data to the ADC appliance using IPv4. The ADC appliance takes that IPv4 response from the server, copies the HTTP application data and transmits it back to the IPv6-connected client.



We tested the IPv6 capabilities of the major ADC vendors' products: A10 Networks, Brocade, Cisco, Citrix, F5 and Riverbed/Zeus. We tested all of the IPv6 features that these vendors listed on their data sheets and determined that all of these systems are suitable for aiding in an Internet edge IPv6 deployment scenario.

One piece of good news: The ADC your company already owns may have IPv6 capabilities. It could be as simple as a software upgrade and you would have an IPv6-capable reverse proxy server that could help accelerate your IPv6 Internet edge deployment.

Long list of features

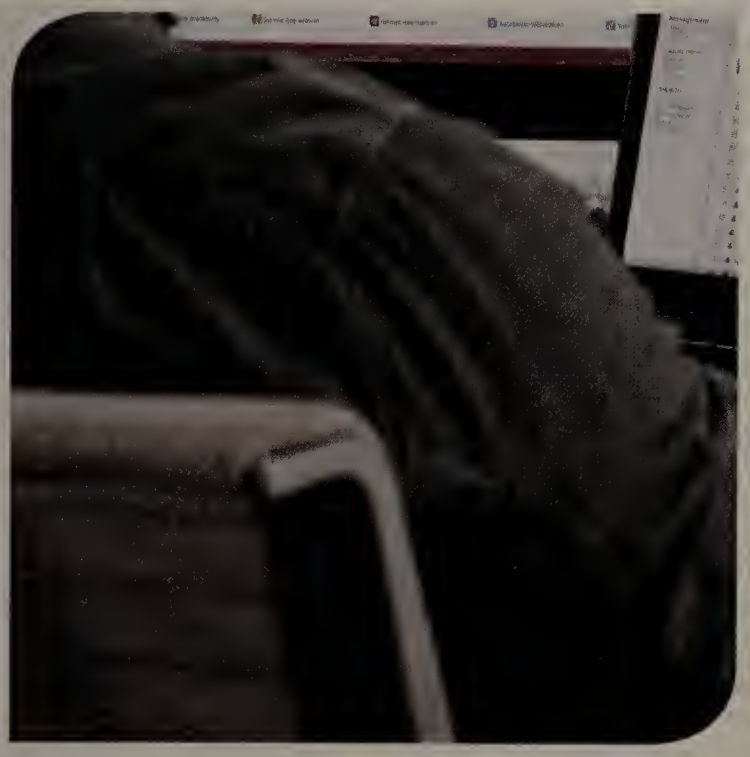
ADCs can provide a wide variety of IPv6 capabilities. Most of the products tested had these features:

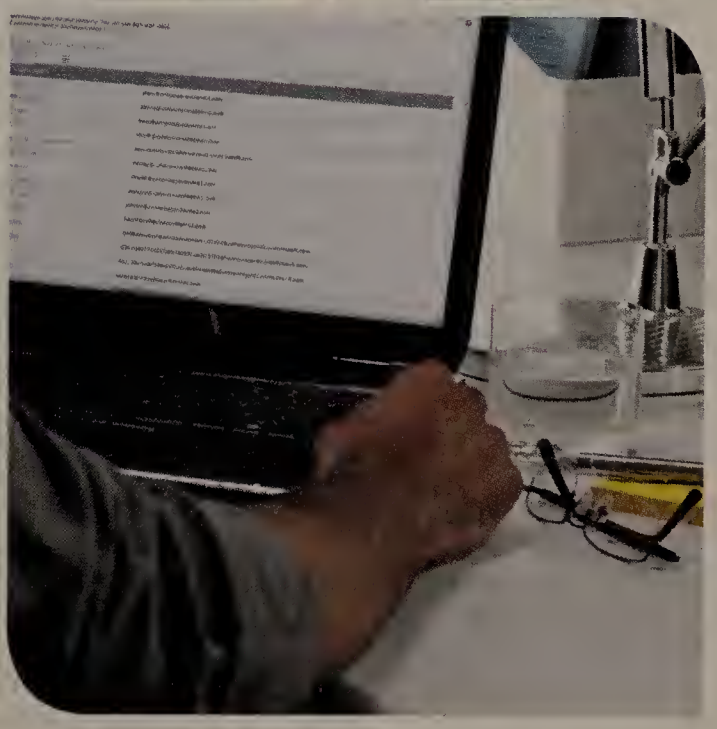
- IPv4/IPv6 server load balancing (reverse proxy), IPv6 VIP with IPv4 or dual-protocol real-servers/server-farms
- SSL offload and acceleration for IPv6 VIPs and servers
- Ability to perform content filtering, regular expression matching and URL rewriting for IPv6 connections
- IPv6-capable Web application firewall (WAF)
- IPv6-enabled security features (distributed denial-of-service [DoS] protection, SYN-cookies, IPS, content filtering)
- Stateful access control lists (ACL) or IPv6 packets, ICMPv6 filtering, extension header filtering and denial of RHO packets
- High availability for IPv6 connections
- Logging of IPv6 connections
- Ability to check the IPv6 neighbor cache entries
- IPv6 static routing
- There are also some nice-to-have optional features:
- IPv6-enabled geographical server load balancing (GSLB)
- Authoritative dual-protocol DNS server
- Stateful NAT64 capabilities
- DNS64 integration with NAT64
- IPv6 routing protocol support (static routing, RIPng, OSPFv3, IS-IS [ST and MT], MP-BGP, RHI)

FEATURES COMPARISON

Company	A10 Networks	Brocade	Cisco	Citrix	F5	Riverbed
Product	AX2500 Version 2.6.1 and 2.6.6	ADX 1216-4-SSL-PREM	ACE-4710-01-K9 Version A5(1.1)	NetScaler MPX7500 Version 9.3-52.3	F5-BIG-3900-E-R Version 11.1	Stingray 4000 VH Version 8.0r0
Price	$24,995	$45,995	$29,995	$22,000	$52,995 plus $23,990	$63,000
6-to-6, 6-to-4 SLB	Yes	Yes	Yes	Yes	Yes	Yes
SSL offload	Yes	Yes	Yes	Yes	Yes	Yes
NAT64/DNS64	NAT64 but no DNS64 — Infoblox	NAT64 but no DNS64 — Secure64	No	No	No	No
IPv6 GSLB	Yes	Yes	No — GSS 4492 separate product	Yes	Yes	Yes
IPv6 WAF	No	No	No	Yes	Couldn't test it	No
LSN/DS-Lite/6rd	Yes	LSN but no DS-Lite or 6rd	No	No	No	No
IPv6 routing	Yes	Yes	No	No	No	No
IPv6 mgmt.	Yes	Yes	No	Yes	Yes	No
Installation	5	4	5	4	3	5
Feature set	5	4	2	4	4	3
Manageability	5	5	4	4	3	5

Microsoft





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- Management with IPv4 and IPv6

There are also IPv6 features that apply to ISPs or large-scale data center companies:

- Large scale NAT (LSN), carrier grade NAT (CGN), NAT444
- 6rd (IPv6 rapid deployment) border relay
- Dual-Stack Lite (DS-Lite) AFTR

Many of these features have crept into ADC products over several years. Some are included as part of the base licensing, but be aware that some vendors may charge a premium for these IPv6 features.

We set up a testing environment that mimicked a typical Internet edge environment. We had an IPv4-only perimeter and we enabled it for IPv6. We performed testing from the perspective of an IPv6-enabled Internet user trying to establish connectivity to an IPv4-only Web server. We also tested NAT64 functionality where an IPv6-only client may be trying to reach IPv4 Internet content.

We tested each of these six ADCs and found that they were all capable of basic IPv4 and IPv6 server load balancing with SSL offload. We found that the support for IPv6 management, IPv6 routing and service-provider IPv6 features varied quite widely among the vendors' solutions. We found that all of these products would be suitable in an enterprise Internet perimeter environment and would aid in the transition to IPv6.

Here are the individual reviews:

A10 Networks AX2500: Highly scalable, feature-rich, lacks Web app firewall

A10 first started supporting IPv6 in its AX series in 2007. Since then, A10 has fully embraced IPv6. Today, A10 offers two version of its software: one (2.6.1) for IPv6 SLB and one (2.6.6) for NAT64/DNS64/DS-Lite/6rd and LSN, also known as CGN or NAT444 (IPv4 preservation).

A10 also has a SoftAX virtual appliance for lab or production environments. We tested an AX2500 which lists for $24,995, however, A10 has appliances that range from $15,995 to $215,000 and its SoftAX virtual appliance can cost between $995 and $24,995. The great thing is that all of the AX features are included without additional license fees.

The A10 Networks AX series of ADCs has many IPv6 features including IPv4/IPv6 SLB with SSL offload and GSLB over IPv6. The AX can perform syslog for IPv6 connections using aFleX Tcl scripts. The AX also allows ping and management access using SSH, HTTP/HTTPS, SCP and SFTP over IPv6 transport.

Unfortunately, there are no IPv6 WAF capabilities in this version, but A10 appliances can integrate with other market-leading WAFs such as Imperva. We found that the A10 does provide other security features like protocol checking for HTTP, HTTPS and DNS, distributed DoS protections, rate limiting and ACLs.

The A10 AX2500 is highly scalable.

Our testing determined that A10 supports static IPv6 routes and dynamic routing protocols for IPv6. The A10 can be configured for RIPng, OSPFv3, IS-IS and BGP.

A10's SoftAX virtual appliance can help support an organization's cloud computing and virtualization goals. The A10 AX appliances also support multi-tenancy and virtual chassis configurations.

AX appliances have extensive scalability due to their 64-bit architecture and their Advanced Core Operating System (ACOS). However, scalability may not be a concern for enterprises that may initially have low IPv6 traffic volumes.

The A10 Networks systems also provide service-provider features such as NAT64 and DNS64. The 2.6.6 software can be configured for NAT64 with DNS64, but there is also a documented Infoblox integration of DNS64 for A10's NAT64 configurations. The LSN, DS-Lite, 6rd, NAT64/DNS64 scalability of these appliances makes them attractive to service providers. In fact, the A10s compete well with more costly heavy-iron solutions from the large router vendors.

Brocade ServerIron ADX delivers

Brocade acquired Foundry Networks in 2008 and Brocade has continued innovating its routers, switches and server load balancers. Brocade first started adding IPv6 features to the ServerIron ADX platform in Version 11.0 and has continued to add IPv6 features to this ADC. We tested a Brocade ServerIron ADX 1216-4-SSL-PREM running Version 12.3.1 and the latest software Version 12.4.00T405, which has a list price of $45,995.

This system has the premium license, which includes Layer 3 routing, IPv6, GSLB and an additional license for SSL offload. Brocade very recently came out with this new software that adds to the number of available IPv6 features. One item of note is that Brocade has a "pay-as-you-grow" licensing model and licenses the ADXs based on the software features, number of processors and bandwidth you require. Therefore, to get IPv6 capability on the ADX you must purchase the premium license.

The ADX supports IPv4 and IPv6 server load balancing as a reverse proxy server. VIPs can use either IPv4 or IPv6 addresses and have either IPv4 or IPv6 real servers. Brocade has completely rewritten its IP stack to accommodate and streamline IPv6. However, our testing revealed that its system only supports SSL offload for IPv4 VIPs using IPv4 real servers or IPv6 VIPs using IPv6 real servers. In software release 12.4, the ADX will be able to perform SSL offload for IPv6 VIPs using IPv4 real servers and mixed protocol server farms.

We set up the ADX and configured Web management over IPv6, and we also entered IPv6 addresses into the configuration through the Web GUI. We used SSH over IPv6 transport and SNMP worked over IPv6. Syslog did not work for IPv6 syslog servers, but IPv6-related log messages can be sent to an IPv4 syslog server.

The ADX also supports a wide variety of IPv6 routing protocols including OSPFv3, IS-IS (single-topology or multi-topology) and MP-BGP.

The ADX offers IPv6 security features and allows you to configure complex IPv6 access-lists. The ADX now supports SYN-Proxy (SYN-cookies) for IPv6 traffic and setting the MSS works for IPv4 or IPv6 packets. We found that other features such as distributed DoS protection, IPS and content filtering are also IPv6-capable. However, the Brocade ServerIron does not have an IPv6-capable WAF.

The ServerIron ADX can act as an authoritative dual-protocol DNS server, function as a DNS proxy server and perform IPv4 and IPv6 GSLB.

The Brocade ADX supports NAT64 in the same software and hardware, but it is configured in a different operating mode from traditional SLB functions. Our testing determined that you cannot have a single ADX appliance function as a NAT64 system and a server load balancer at the same time.

The ADX has capabilities for IPv6-only or IPv4-only clients. The Brocade ServerIrons can perform LSN)/CGN)/NAT444, but do not currently support 6rd or DS-Lite.

Cisco ACE: features are limited

The Cisco Application Control Engine (ACE)

Read how IPv6 dual-stack strategy starts at the perimeter. *tinyurl.com/7oapjmy*

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has been available for many years in many forms but only a few months ago did the Cisco ACE begin to support IPv6. ACE software release A5 (1.1) runs on the ACE30 module for a Cisco 6500 switch and the ACE4710 appliance. Unfortunately, customers that have invested in ACE10 or ACE20 modules will not be able to use this version and will face hardware upgrades to support IPv6. There are ACE10/20 to ACE30 upgrades available for $30,000. The device that we tested was the ACE-4710-01-K9 running software Version A5 (1.1), which has a list price of $29,995.

Cisco ACE modules and appliances have licensing that allows the upgrade of the performance of the units, the number of SSL connections and number of virtual contexts. There is no additional charge for IPv6 support on the ACE. If you are familiar with configuration of Cisco devices using contexts then you will feel right at home with this system.

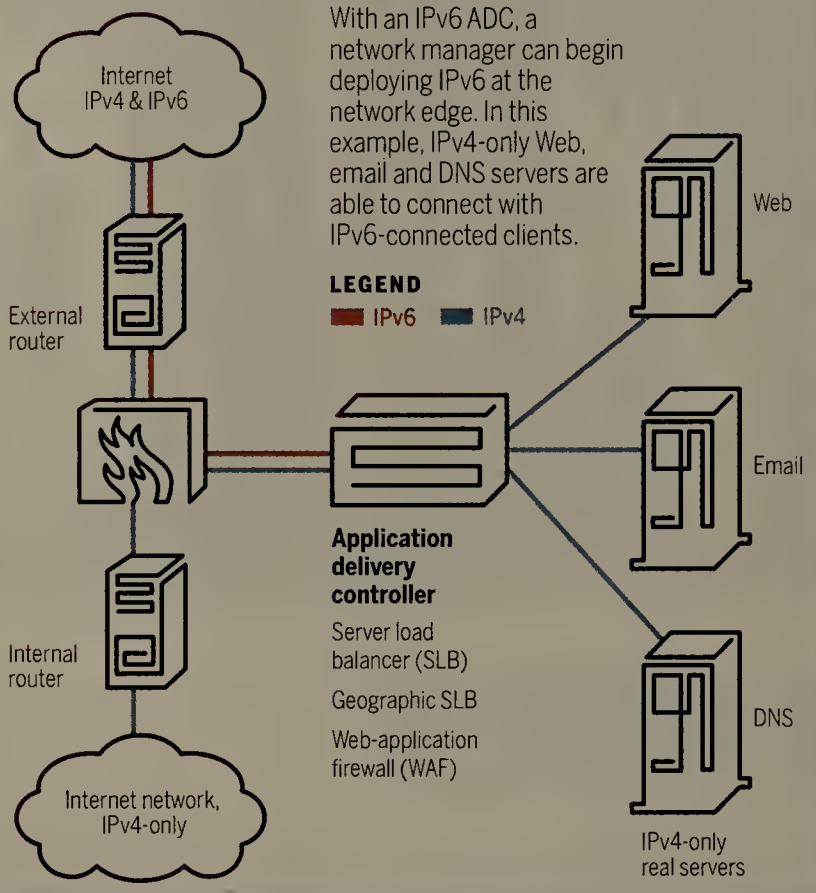
The Cisco ACE performed server load balancing for IPv6 VIPs with IPv6 real servers and IPv6 VIPs with IPv4 real servers. We easily configured IPv6 health probes and the Layer 4/Layer 7 policies and SSL offload work for IPv6 connections. HTTP/HTTPS and DNS inspection (application awareness) work for native IPv6-IPv6 traffic. The ACE allowed us to configure IPv6 ACLs and perform packet capture of IPv6 packets. The ACE has IPv6 security features and it can filter extension headers and perform fragmentation inspection, IPv6 ICMP-guard, IPv6 normalization and IPv6 Unicast-RPF checking. The ACE can act as a DHCPv6 relay and can either send routing advertisements on its Ethernet interfaces or suppress them. In the ACE, fault tolerance is not supported over IPv6 but it can track IPv6 connectivity and use IPv6 alias addresses on its interfaces.

The ACE does have some limitations. It does not support IPv6 dynamic routing protocols, but it does have IPv6 static routing and IPv6 Route Health Injection (RHI). The ACE does not have stateful NAT64 with or without DNS64. We could not configure IPv6 transport for management protocols (SSH, Telnet, SNMP, HTTP/HTTPS) but IPv6 MIB values are available for SNMP query over IPv4 transport.

We were able to perform IPv6 configuration through the Web GUI, but it is only accessible over IPv4. We could ping the ACE using ICMPv6 and could send syslog messages with IPv6 addresses in them. The ACE GSS 4492 does have IPv6 support for GSLB. However, in August 2011, Cisco announced end of sales for its ACE WAF so it will never be IPv6-capable.

IPv6 application delivery controllers

With an IPv6 ADC, a network manager can begin deploying IPv6 at the network edge. In this example, IPv4-only Web, email and DNS servers are able to connect with IPv6-connected clients.



Citrix NetScaler: Fully featured

NetScaler has supported IPv6 for more than seven years. IPv6 capabilities are available in the platinum, enterprise and standard edition feature sets and now IPv6 comes enabled by default for no additional cost. We tested using a Citrix NetScaler MPX7500 running software Version 9.3-52.3 that costs $22,000. In addition to Citrix's hardware appliances, the company offers a virtual appliance called the NetScaler VPX.

It was easy to configure IPv6 addresses on interfaces and VLANs through either a command line interface (CLI) or the GUI. The NetScaler supports configuring IPv6 VIPs with IPv6 or IPv4 services. SSL offload worked for IPv6 and health probes operate over IPv6. Content switching worked for IPv6 connections and regular expressions could be created using IPv6 addresses. URL rewriting also worked for IPv6 VIPs. We could configure IPv6 for RADIUS servers, TACACS+ servers, LDAP servers, syslog servers and DNS servers.

The NetScaler can be an authoritative DNS server for IPv6 AAAA address records, which is important for the GSLB functionality. IPv6-capable DNS services help make GSLB work for IPv6 addresses. High availability could also use IPv6 addresses. We could create traffic filters that contain IPv6 addresses and IPv6 ACLs were easy to configure. We could manage the NetScaler over IPv6 transport and there are IPv6-specific MIBs/OIDs for the NetScaler that we could query over IPv6 SNMP. We were also able to create custom log formats using IPv6 source/destination addresses and v-server address.

The built-in Web application firewall helps secure IPv4 and IPv6 services from attacks. Policies can be created and applied to IPv6 applications just as easily as for IPv4 applications. The NetScaler software allows for the configuration of static IPv6 routes, and we also configured OSPFv3 and RIPng in the IP Infusion ZebOS Cisco-like interface. The NetScalers have IPv6 NAT, inbound network address translation (INAT) and prefix-translation capabilities. The NetScalers also support NAT64 and DNS64. The Citrix NetScaler also has IPv6 SSL VPN "Access Gateway" services.

F5 Big-IP: Easy to customize

F5 has supported IPv6 in its BIG-IP ADC products for several years. The device we tested was the BIG-IP 3900 Local Traffic Manager Enterprise Edition, which has a list price of $52,995. This unit also includes the Global Traffic Manager module, for an additional $23,990. We tested using BIG-IP software Version 11.1.0 Build 1943.0. The F5 hardware architecture combines x86_64 processors and FPGAs/network processors to provide performance and flexibility.

It was relatively easy to configure the unit with IPv6 addresses for self IPs. It was easy to use the GUI to configure IPv6 VIPs for IPv4 or IPv6 application servers. F5 supports IPv6 static and dynamic routing through the IP Infusion ZebOS configuration CLI, although we had difficulties getting router adjacencies configured. The BIP-IP supports route domains (like virtual routers) and administrative partitions (multi-tenancy) and virtual clustered multiprocessing (vCMP) (running

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different software versions simultaneously on their chassis hardware).

The documentation mentioned that you must configure radvd for IPv6 support. However, we found that you do not need to configure radvd unless you need the BIG-IP to act like a default gateway router. In other words, if you want computers that are directly connected to the F5 to hear the router advertisement ICMPv6 messages from the F5, then you must configure radvd through CLI.

We configured the Web management interface to use over either IPv4 or IPv6, but it cannot do both simultaneously. The self IPs were reachable using IPv6 and SSH, and the F5 did allow for remote management of the system using IPv6 using SNMP v1/v2c/v3.

One of the powerful features of F5 LTMs is the iRules event-drive scripting language that allows the administrator to customize how application traffic is handled. iRules can be configured for matching on IPv6 addresses.

The latest version, 11.1, now has IPv6 support for the Application Security Manager (WAF). This operating mode on the BIG-IP hardware should provide HTTP protocol inspection to protect IPv6 Web applications, however, we were not able to get this configured.

F5 also sells a virtual appliance called the BIG-IP Local Traffic Manager (LTM) Virtual Edition (VE), which can be an IPv6 load balancing gateway with NAT64/DNS64 support.

Riverbed Stingray Traffic Manager: Easy to set up

Zeus Technology, which has been in business since 1995, released a virtual ADC appliance in 2004 and added IPv6 support to Zeus Traffic Manager in 2008. Last year Riverbed acquired Zeus, and now the virtual ADC system is called the Stingray Traffic Manager.

Stingray Traffic Manager Version 8.0 was released on Oct. 25, with Version 4.1 of the Stingray Application Firewall now built into the Traffic Manager software distribution. Pricing for the Riverbed Stingray Traffic Manager 8.0 starts at $5,500 and goes up to $63,000 for the 4000VH.

The Stingray Traffic Manager was very easy to set up as a virtual machine (VM). Nothing needed to be configured on the CLI of the virtual appliance. The only time we used the CLI was to gracefully shut down the system. All other administrative tasks were performed with a Web browser to connect to the management interface IP address.

Configuration was very simple and in just a few clicks we had IPv4-to-IPv4, IPv6-to-IPv6 or IPv6-to-IPv4 load balancing configured. The interface is intuitive enough that you may even be able to resist the urge to read the manual and still configure it successfully. It was trivially easy to configure IPv4 and IPv6 front-end and back-end servers and services and IPv6-enabled SSL offload. Anywhere we could configure an IPv4 address we could configure an IPv6 address instead. We found that if we configured a full qualified domain name (FQDN), then it performed an IPv4 DNS lookup first, but if that fails then it used the IPv6 address returned by DNS. The Stingray Traffic Manager does not support stateful NAT64 but it does function as a proxy for IPv4 and IPv6 connections. Stingray Traffic Manager Version 8.0 does not support IP transparency for IPv6 back ends or clients.

The Stingray supports TrafficScripts, which can be used for advanced traffic handling or for preventing distributed DoS attacks. We even successfully tested the Stingray Traffic Manager ZeusBench, which is a built-in IPv4/IPv6 traffic/server testing system. Information exchanged between traffic managers or clusters is done over IPv4 and heartbeat messages use only IPv4 packets.

The Stingray Application Firewall, the Application Firewall Module (AFM), does not support IPv6. Also the GSLB Multi-Site Manager (MSM) lacks IPv6 capabilities. The Zeus Traffic Manager cannot run a dynamic routing protocol like OSPFv3, but this is in development and should be available soon.

Conclusions

The transition to IPv6 is already underway. Much of your IPv6 Internet-perimeter infrastructure is already IPv6 capable. Regional Internet registries have IPv6 addresses to give you, and your ISP may already have IPv6 Internet connectivity ready for you.

Use of an IPv6-capable reverse proxy server could help accelerate your IPv6 Internet edge deployment. If you already own one of these systems, you have very little capital expenditure to get your organization's Web applications to be reachable with IPv6.

If you own an ADC that does not have IPv6 capabilities then it would be worth speaking to your vendor. However, if your vendor has not put IPv6 on its product development road map, then you are likely to be purchasing a new system to gain this functionality. Any of the six products in this test will fit the bill. ■

Hogg, is director of Technology Solutions at GTRI, chair of the Rocky Mountain IPv6 Task Force, and author of a Cisco Press book on IPv6 security. He can be reached at scott@hoggnet.com.

How to shop for application delivery controllers

The difference among application delivery controllers is the way they can be integrated into your organization's network topology. Most organizations may deploy a server load balancer/ADC in-line as a Layer-3 reverse-proxy-server. This configuration requires public/global addresses on the external interface and private addresses on the internal interface. On the back end, IPv4 servers use RFC1918 IPv4 addresses, but with IPv6 it is not necessary to use private unique local addresses for the internal networks. ADCs that operate this way are fully stateful and perform TCP normalization and traffic inspection, which benefits security.

Other products may operate virtually in-line as a proxy server, but not be directly in the traffic path. These solutions may require the use of source-NAT or Policy-Based Routing, or act as the server's default gateway to force the traffic through the ADC. These products can allow Direct Server Return and may lack stateful awareness of the connections.

Other systems may operate at Layer 2 and create a bridge between two virtual LANs or subnets. These products may use a bridged virtual interface or proxy and/or source-NAT to get the traffic to go through the appliance.

There are also more products being offered as a virtual appliance at the hypervisor layer. The server VMs use the virtual appliance as their proxy-server or default gateway. Many organizations prefer virtual appliance solutions because they are easy to test and can be deployed quickly.

Another feature that is important is URL rewriting. If the external FQDN for the IPv6 website is different than the IPv4 internal Web application's embedded links, then those links will need to be rewritten to the IPv6-FQDN. This feature will ensure that the site does not automatically fall back to the IPv4-embedded links and keeps the client believing that the entire site is reachable over IPv6.

— *Scott Hogg*

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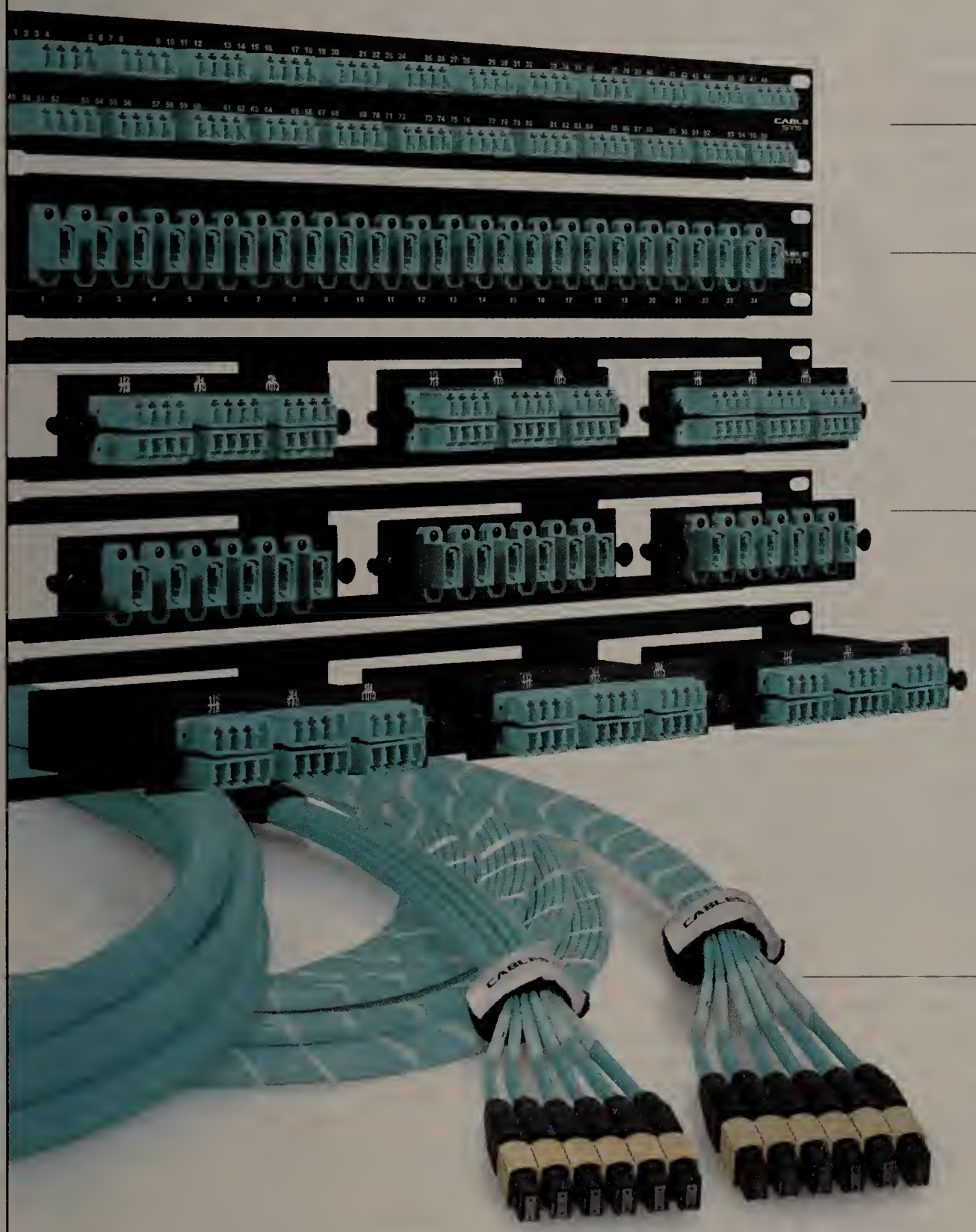

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First look: Cisco Cius

A mobile collaboration device that means business

BY TOM HENDERSON

We had a chance to see the Cius tablet at a Cisco office in Boston, and while we weren't able to bring it back to our own lab and pound on it, we did get a pretty good feel for what the Cius is and what it isn't.

First off, Cius is not a consumer tablet. In fact, it's only available through the Cisco partner network at a price of less than $750 for the endpoint and less than $350 for the media station, for a total of less than $1,100. In other words, if you're just looking to read a book on the beach, pick up a Kindle Fire for $199.

That's not to say you can't use the Cius for consumer-oriented functions, but to get the full benefit of Cius's rich set of collaboration and productivity features, the device should to be connected to Cisco Unified Communications Manager (CUCM) on the back end.

We found that the Cius is a carefully thought-out videophone-cum-tablet endpoint with many best-of-breed internals, like 4G speed and a docking station with purpose.

The Cius unit is based on Android, and the initial basic appearance was that of most other generic Android tablets. Based on our prior test of enterprise tablets, the Cius reminded us of the Fujitsu Stylist. That's where superficial comparisons end, however, as Cius's software payload, with collaborative emphasis and VoIP/conferencing accessorizing, is huge.

First, the specs.

The tablet size is small, with a screen size of just 7 inches — although it supports 1280x600 HD video at 30 frames per second, and it weighs less than 2 pounds. It has front and backside cameras, and is powered by an Intel Atom CPU with a gig of RAM. The Cius docking station we saw had audio, and props the unit into an angled viewing position to fulfill one of the Cisco-stated missions of the Cius unit: videoconferencing and/or VoIP — collaboration is the theme.

You get serious Wi-Fi, and perhaps AT&T's 4G (technically 3.8G), although we didn't get to see AT&T connectivity or use it. Soon, we were told. The display on the videoconferencing demo we were shown, over a fast Wi-Fi connection, was stunningly clear.

Cius's compatibility with CUCM means you can enforce security policies and manage applications. You can change the battery in seconds, we found. Differing capacities of storage are available.

We saw plenty of jacks There's a mini-HDMI jack that was used to power large screen displays during our demo, a micro-USB jack and an SD card jack. There's also an Ethernet jack — something that's missing from most of the "business-focused" tablets we've seen so far.

With all of the jacks, and a memory port, one questions if users can access root or violate policies that might cause compliance or conformance problems. Cisco was all over that question. Through Cisco's secure boot (not tested) and CUCM, Cisco offers mobile device management (MDM) with lengthy use policies, giving administrators a lot of options.

Our hacking challenge instincts were twigged. Could MDM controls be thwarted? On top of Cisco's MDM controls are ActiveSync controls which join Outlook and Microsoft Exchange administrative controls to the Cius. There are, therefore, two ways to control Cius user behavior: with Cisco's unified communications components and Microsoft ActiveSync.

Cius is all about collaboration, according to Cisco, and the applications we saw follow this theme. The base Cius software load includes Cisco's WebEx application, along with Jabber. WebEx is familiar to the corporate world as a heterogeneous operating systems-compatible conferencing application with VoIP capabilities.

Jabber enables a chat client, which can be used with XMPP chat clients (we use Adium as a base client) to enable single IM or group chat. The WebEx application sharing demo that Cisco set up for us was fast. We have no idea whether it was optimized for the demo, but it looked good and added voice and video interaction successfully.

Also included are calendar, email and visual voice mail applications, although we didn't get a chance to examine these thoroughly. With ActiveSync added, the Cius ought to be Outlook/Exchange compatible, but we don't know to what degree. Storage is limited (32GB of flash), but there are external storage capabilities through USB that might assuage storage concerns.

In the dock

The Cius docking station adds connectivity and sound. Tablet docking stations are an approach that Motorola and others have taken, although not with much success. But with the Cius, it's almost mandatory for its added functions. Cisco therefore might have more success with a docking station in this purposefully collaborative context.

A third-party Bluetooth keyboard was used with the docking station (and it could be used directly, as the Cius supports Bluetooth 3.0), and we found this "tethered" keyboard (from Logitech) to be tenable.

Unlike the Motorola docking station, the Cisco Cius/docking station combination had larger speakers and "mini-stereo system" sound. The brightness and resolution of the display made the videoconferencing demonstration, coupled to the docking station audio, a compelling experience.

The bundled software applications are also designed to manage contacts with on-screen push buttons to rapidly "dial" or choose participants for conversations, a bow to the endless milieu of corporate business meetings — but these are online rather than face-to-face.

Cius apps are Android apps, although they're accessed through a Cisco Android marketplace called AppHQ. This walled-garden approach to accessing applications allows administrators to impose constraints.

We were unable, however, to find any application review or security test regimen on Cisco's Cius developer website that would restrict an "evil" AppHQ from distribution via AppHQ.

Overall

Cisco packs a lot of purpose into its smallish 7-inch tablet. This is not for consumers, although all of the typical tablet entertainment apps will probably work—if they're allowed. The Cius is a business-focused tablet that delivers mobile collaboration for enterprises. ■

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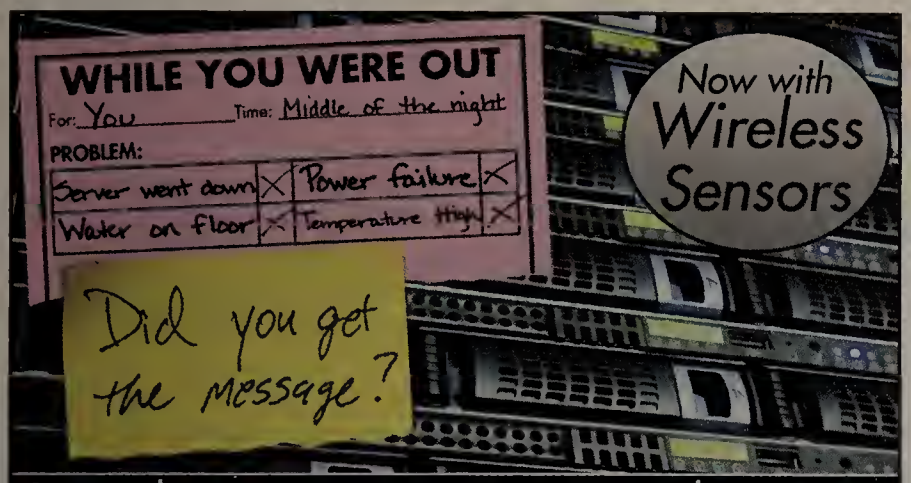

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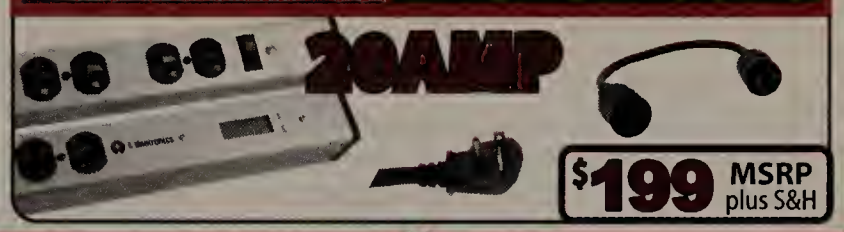

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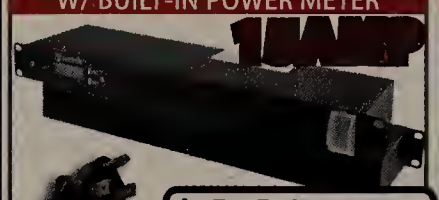

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► **Hadoop,** *from page 1*

Increasingly, IT shops are finding a place for Hadoop in their data architecture plans. The appeal is that Hadoop can enable massively parallel computing on inexpensive commodity servers. Companies can collect more data, retain it longer, and perform analyses that weren't practical in the past because of cost, complexity and a lack of tools.

At Concurrent Computer, the decision to use Hadoop was driven in large part by volume. "Scalability was the biggest concern. With a traditional relational database, every time you want to scale or get bigger, you end up paying a premium," says Will Lazzaro, director of engineering at Concurrent, which provides video-on-demand systems and processes billions of records a day related to viewers, content consumption and platform operations.

Playing with big data

Hadoop lets enterprises store and process data they previously discarded — log files, for example — because it was too hard to process and didn't fit cleanly into traditional database schemas. That's the crux of so-called big data, says Matt Aslett, research manager at 451 Research.

In addition to being scalable, Hadoop computing systems are flexible. Hadoop is schema-less, which lets users join and aggregate data from disparate sources for more complex analyses. New nodes can be added as needed, and Hadoop's built-in fault tolerance features allow the system to redirect work to another location if a node is lost.

"That schema-less approach, which lets you just store the data and then figure out what you want to do with it, is much more appropriate for unstructured and semi-structured data like Web log data, as well as for data that you know has value for the organization, but you may need to do some experimentation to figure out what that value is," Aslett says. "The cost of doing that in an enterprise data warehouse would just be prohibitive."

Return Path, an email certification and reputation monitoring company, started experimenting with Hadoop in 2008, attracted by its enormous storage potential and the ability to easily scale the platform by adding servers. Return Path collects massive amounts of data from ISPs and analyzes it to establish email sender reputations, pinpoint deliverability issues or monitor potentially harmful messages, for instance.

In the early days, signing on a new ISP or two could result in a quadrupling of its data. The company found itself in a position where it couldn't keep data as long as it wanted to, nor could it process the data as fast as it wanted to, recalls CTO Andy Sautins. Over the years, he and his team tried a few custom solutions to augment the company's traditional enterprise data warehouse. "These worked fairly well but required much more time and investment in software development than made sense," Sautins says.

Hadoop was a game-changer. "It let us change the conversation around what it meant to retain data. It wasn't in terms of weeks, it was years," Sautins says.

Moving out of the shadows

Apache Hadoop includes two main subprojects: the Hadoop Distributed File System (HDFS), which provides high-throughput access to application data, and Hadoop MapReduce, which is a software framework for distributed processing of large data sets on compute clusters. It's augmented by a growing group of Apache projects, such as Pig, Hive and Zookeeper, that extend its usability.

Hadoop's emergence as an enterprise platform mirrors in many ways the arrival of Linux: Deployments were preceded by shadow IT projects, or skunk works, to test the merits of the software before adopting it on a wider scale.

Adoption is growing largely through developers, Aslett says. "It's just as we saw Linux move in to enterprises through the IT department and internal projects, when the CEO/CIO didn't necessarily know that it was in there."

The emergence of vendors with commercial, enterprise-oriented Hadoop distributions — including support, management tools and configuration assistance — has further accelerated adoption in the enterprise realm. Key players in this arena are Cloudera, MapR Technologies and Hortonworks, which was spun out of Yahoo last year to develop its own distribution of Hadoop.

Concurrent uses the Cloudera CDH platform. Return Path started working with MapR's commercial distribution last year, which boosted performance roughly 2.5- to three-times, Sautins says.

Along with multiplying options for commercial Hadoop distributions, there are other signs the open source platform is gathering steam. Venture capital is flowing, and new startups with management add-ons and analytic applications are appearing at a dizzying pace. It's also getting increasing attention from traditional data management players — including IBM, Oracle, Microsoft and EMC — eager to cash in on the action.

Hadoop makes it easier to process big data, but it's no cure-all. One common challenge for enterprises is how to choose the most appropriate technology to handle different kinds of data.

"There's still a lot of confusion about what applications, what workloads, should be on Hadoop vs. those that should be in a traditional enterprise data warehouse," Aslett says. "Unfortunately at this point, there aren't any easy answers for that."

Another challenge that will only heighten as Hadoop heads for the mainstream is finding people to work with the technology. "There's a lack of skills, and that's definitely a challenge in terms of the continued adoption of Hadoop," Aslett says.

"If you go out there and try to hire, it's incredibly difficult," acknowledges Omer Trajman, vice president of customer solutions at Cloudera. A more feasible approach is to look internally for candidates ripe to learn Hadoop, he suggests.

On the positive side, as awareness of Hadoop grows, the number of IT pros learning Hadoop is growing, too.

"Every time I've talked to a recruiter for the last two years, I've asked if they have anybody with Hadoop experience. Usually the answer was 'ha-what?' Increasingly it's maturing, so you are seeing more people in the field," Lazzaro says. ■

Hadoop is hot

A skills shortage, influx of venture capital, and proliferation of Hadoop distributions show Hadoop's increasingly mainstream popularity.

#7 hot job
Hadoop is the seventh fastest growing keyword found in Indeed's online job postings.

23 distributions
Apache lists 23 products that include Hadoop or derivative works and commercial support.

653 jobs
A keyword search for Hadoop turns up 653 jobs on Dice.com

9 petabytes
eBay has 9 petabytes of data in its Hadoop and Teradata clusters

$100 million
Accel Partners unveiled its $100 million big data fund during a keynote at Hadoop World.

NETWORKWORLD

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BACKSPIN | BY MARK GIBBS

HR 1981, the jaws of law will eat your Internet

YOU REMEMBER in "Jaws" where a girl is swimming in the ocean and the music starts playing ("dun-dun, dun-dun, dun-dun...")? You know what's going to happen ... at the last moment she sees the shark's fin and, "eeeekkkkkkkkk!" ... too late! CHOMP!

Well, that's sort of the way things are shaping with a bill that has implications just as worrying as the two recently squashed but not yet truly dead bills, Stop Online Piracy Act (SOPA) and Protect Intellectual Property Act (PIPA), that I sliced and diced a couple of weeks ago.

The sea in this horror movie is once again the Internet, the swimmer is you and me and all U.S. Internet users, and the shark is called the Protecting Children From Internet Pornographers Act of 2011.

The problem with this bill lays not in its core intentions, to provide a framework in which to define, prosecute and punish online child pornography. Quite obviously that is a hugely important topic and one that needs to be addressed. The problem is in its implementation and unintended consequences.

Sponsored by the out-of-touch and uninformed Rep. Lamar Smith (R-Texas), who was also the lead sponsor of SOPA ("eeeeeekkkkkk"), the bill, HR 1981, was introduced last year to broad condemnation by pretty much anyone with a clue about the online world (the American Civil Liberties Union, The Electronic Frontier Foundation and The American Library Association were particularly vocal).

Alas, people with a clue are apparently not among the 39 co-sponsors of the bill, which was passed by House Judiciary Committee on Dec. 16 and placed on the Union Calendar. That may not sound important, but according to several sources, including The Next Web, this means the bill has been given what is called "expedited consideration," which puts it on a fast track to being passed!

So, what's so bad about the Protecting Children From Internet Pornographers Act of 2011? Well, hidden among the good provisions is the requirement that "A commercial provider of an electronic communication service shall retain for a period of at least one year a log of the temporarily assigned network addresses the provider assigns to a subscriber to or customer of such service that enables the identification of the corresponding customer or subscriber information ..."

What the proposed legislation wants is for your ISP to keep detailed records of the IP addresses assigned to you so if you are suspected of being a bad guy, your past activities can be reviewed.

Apart from the obvious violation of our constitutional rights, the thing that should have us all worried is the almost guaranteed abuse of the tracking data that will occur. Just consider how easily cellphone providers have been known to give in to cellphone tracking requests.

The biggest problem with HR 1981 is that very few of its sponsors really understand the bill's implications. One of its few vocal opponents, Rep. Zoe Lofgren (D-Calif.), renamed the bill the "Keep Every American's Digital Data for Submission to the Federal Government without a Warrant Act," which is exactly the problem.

Be warned ("dun-dun, dun-dun ...") this bill is relentlessly slicing through the legislative process and, if it passes, it will eat up even more of our liberties ("eeeekkkkkkkk!"). ■

Gibbs is treading water in Ventura, Calif. Tell backspin@gibbs.com if you can see the threat.

NETBUZZ | BY PAUL MCNAMARA

In-flight Wi-Fi, missing science and a survey

AT FIRST blush, it's another one of those, "Sure, it will happen ... eventually," type of situations. I mean does anyone envision a commercial air fleet without readily available Internet service 20 years down the runway?

That seems unlikely, yet efforts to get such service off the ground have produced spotty results, with one report saying 7% of U.S. passengers availed themselves of in-flight Wi-Fi last year, perhaps because it's still only available on 16% of airplanes.

"The 7% isn't too bad," said Amy Cravens, an analyst at In-Stat, in an interview with *Computerworld*. She noted that was up from 4% in 2010. "However, the service isn't profitable at these levels, so everyone is hoping it improves."

It will. But it's not as though the technology has just appeared; it's been around about a decade. So I'm thinking that there's more than just availability and high prices holding usage back.

Maybe more people than will admit it actually welcome a couple of hours of being disconnected.

Matchmaking sites short on the science? ... Get out.

A group of bitter, bitter researchers has chosen this generally joyous run-up to the holy day of romance to issue "a sweeping review of scientific studies" that allegedly shows dating sites such as Match.com and eHarmony fail to apply to their matchmaking the same scientific rigor normally associated with, say, astrology.

From an IDG News Service story: "Companies have not made their algorithms [for matching potential mates] available to the public, nor even to regulatory authorities. Nobody knows what the algorithms are," said Harry Reis, a professor at the University of Rochester. " It is certainly possible they have some magic formula no one has looked at that could in fact be effective. However, there is no evidence for that."

In other words, it's like the eTrade baby telling the guy who's building his retirement account using scratch tickets: "You realize that the odds of winning are the same as being mauled by a polar bear and a regular bear in the same day?"

Yes, I'm being overly harsh and these sites undoubtedly have saved many a lonely heart.

Another study shows vendors think we're stupid

Time for a pop quiz. The press release reads:

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Now what type of "solutions" do you suppose Vendor X sells? (I see all of you have your hands raised.)

Yes, of course, it's this type. ■

Alternative answers should be sent to buzz@nww.com.

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